# NATURE MAGAZINE

AUGUST 1927
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With the next Congress it is expected that an active drive will be made looking to the establishment of an antelope preserve in eastern Oregon. Members of the American Nature Association are urged to join in support of this movement and as matters develop information will be given in Nature Magazine. It is expected that the Izaak Walton League will be particularly active in the legislative phase of this work, but all conservationists and Nature lovers will find this a cause to which they can lend their support.

* * *

Speaking of conservation, may we call particular attention to the article in this issue on the Heath Hen. This is written by George Wilton Field, former Fish and Game Commissioner of Massachusetts, under whose régime the bird was given a new chance to prosper. This article is a fit companion to our pleas in behalf of the useful hawks and the vanishing woodcock, both of which attained wide notice and appreciation.

* * *

Still on the subject of bird conservation, we have received an interesting report from Howard H. Cleaves, one of the Association's lecturers, who is in southern Labrador hunting with the camera. Mr. Cleaves sends an important wire which reads:

"Eider ducks numerous along Canadian Labrador coast due to excellent protection by the government. I have seen more than two thousand breeding birds in ten days' cruising. Hundreds of them in each of four sanctuaries sighted to date. Despite lingering snow banks and passing icebergs some eiders have hatched. This fine bird is making a wonderful recovery from shadow of extinction and with good weather there will be a large increase this year." Canada is to be congratulated on this.

William L. Finley, our Director of Wild Life Conservation, has made a successful photographing and data-seeking trip into Lake County, Oregon, in search of antelope. Under special permit the party was permitted to bring back a live antelope fawn, not an easy individual to capture. Another trip will be made into the antelope country during the late summer to get photographs of antelopes at water holes. Some fine material for Nature Magazine promises from this trip. It should also add more excellent material to Mr. Finley's lectures, which, incidentally, can be booked through the Princeton, N. J., office of the Association. Information about other lectures can be obtained from this office.

* * *

We are glad to report satisfactory progress on the new building of the Association which will double the present overcrowded quarters. In the Fall we will be able to show members visiting Washington an Association home whose every corner is not taken up by the growing work of the organization.

* * *

A 24-page booklet with color illustrations presenting "A Plea for Our Hawks" is now available in quantities at cost for organizations. A printing of 10,000 was made and 6,000 have already been purchased by organizations.

* * *

About the time this issue is in the mails, the Association's expedition led by our President, Arthur Newton Pack, and our Art Director, R. Bruce Horsfall, will be starting for its mountain goat and sheep hunt in the Rockies. Needless to say, the weapons are camera and sketch book both of which assure records that will last.

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### *Bird Values*

Considerable has been the literature on the food habits of our North American birds, but for the individual with a lay interest or the ornithologist needing a handy reference, there appears to be no condensed volume digesting the available literature. That is, there was no such volume until Junius Henderson, professor of natural history at the University of Colorado, wrote *The Practical Value of Birds*. He divides his book into two parts, devoting the first to a general discussion of the subject and covering the services rendered to man by the birds he so often persecutes, and the second to a more systematic discussion and digest of the food habits of these birds by orders, families and species. The book is liberally supplied with footnotes and references to aid the reader or student who wishes to make wider research. This volume is an important contribution to ornithological literature. It is published by The MacMillan Company and listed at $2.50.

### *Nature on the Air*

One of the most interesting and valuable features broadcast from Station KDKA of the Westinghouse Electric and Manufacturing Company has been the series provided by the University of Pittsburgh. The talks have been gathered into attractively-printed, paper-covered volumes and have won a wide distribution. They have covered a wide range but one series of particular interest to Nature lovers is brought out in a book entitled *Spring: The Naturalist Afield*. The speakers, and, hence, the authors, in this instance are Otto Emery Jennings and Samuel Howard Williams, professors respectively of botany and zoology. This book, which is known as Radio Publication No. 30, can be purchased from the University for seventy-five cents. Another interesting series available at the same price is Radio Publication No. 23 on *Science in the Home*.

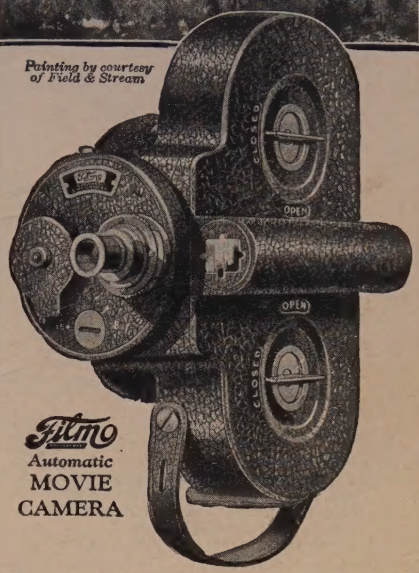
### *Nature Poetry*

Those who love Nature poetry infused with the fresh breath of the outdoors will find most delightful a little volume of verse by W. W. Christman brought out under the title, *Songs of the Helderhills*. Space does not permit the reproduction of any of these musical and attractive lines and we will have to leave it to those interested to discover for themselves. The publisher is Harold Vinal, 562 Fifth Avenue, New York City and the book sells for $1.50.

### *For Herpetologists*

Scientific contributions to, and current information on, the relation of snakes and other poisonous animals to man are contained in the new quarterly publication of the Antivenin Institute of America, which made its first appearance in March. The

*Painting by courtesy of Field & Stream*

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Articles for Nature Magazine telling of his Labrador experiences will be prepared by Mr. Cleaves and his new lecture *Cruising the Canadian Labrador* will be ready Nov. 1st. Mr. Cleaves offers also *Outdoors in the West, Birds of the Atlantic Coast* and other illustrated lectures on wild life adventure and travel. For terms and information address: *Extension Department,*

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Institute and the Bulletin are devoted to a field in which comparatively little scientific research has been devoted in the United States. The publication, according to the editors, will seek to present original research and semi-popular articles along the lines which the organization is following. The subscription price is $1.50 a year. Any information desired about the publication will be supplied by addressing the Institute at Box 1404, Philadelphia, Pa.

### *On Nature Trails*

It is often that the Nature trails followed with no preconceived plan are the most interesting and richest in the results returned. It is such wanderings in Nature that Dietrich Lange has set down in his little volume, *Nature Trails,* published by D. Appleton and Company and brought out for $2.00. The author covers experiences in the Great Dismal Swamp of Virginia and in Montana; in the highlands of the Hudson and the Dakota plains. He writes simply and directly, making the book admirably adapted for school as well as home use. It is illustrated by many pictures taken by the author.

### *For Canary Lovers*

A copy of a young publication of specialized interest has just come to hand in *The Canary World,* a monthly publication of the American Association of Canary Breeders, 59 Willis Avenue, Youngstown, Ohio. It is devoted to instructive material on the care, breeding and training of canaries, has a subscription price of one dollar a year and made its first appearance with its April issue. Information about the organization and its little magazine can be obtained from the address quoted above.

### *What Tree Is That?*

E. G. Cheyney, director of the School of Forestry at the University of Minnesota, is the author of a series of boys' books on forestry,—boy fiction, to be exact. They form a mighty good series and Mr. Cheyney has now added to his forestry writings a new tree identification book. It bears the title, *What Tree is That?,* is published by D. Appleton and Company and sells for two dollars. Mr. Cheyney enters a field in which there is much competition with this latter volume, but his book is clothed with an authenticity and a simplicity that equips it to compete with the numerous tree identification books already on the market. It is specially aided by a unique and useful index based on the varying leaf structures of trees.

### *A Forestry Career*

Forestry is a comparatively young profession but it is one with many attractions for the youth with a bent for the out-of-doors. In a pamphlet with the title, *Forestry as a Profession,* Edward A. Sherman, associate forester of the United States, has set forth the requirements, opportunities and ideals of this calling. Copies of the bulletin may be obtained on request from the United States Forest Service, Washington, D. C.


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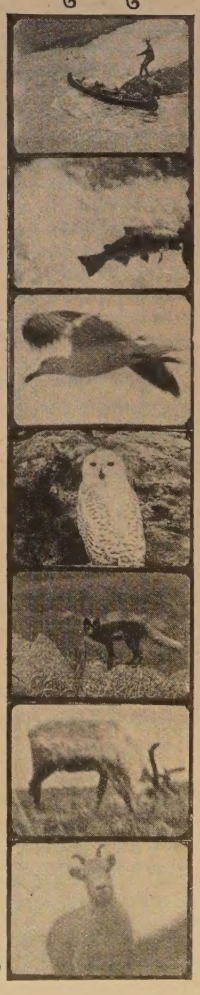

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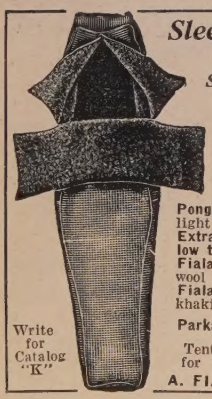

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---

*The American Nature Association will be glad to answer each month such questions as its members ask about Nature.*

QUESTION: *What difference is there between a cougar, a mountain lion, and a puma?—G. M. W.*

ANSWER: The names cougar, puma, and mountain lion all refer to the same animal. The eastern species is now called *Felis couguar*. Various races range from southern Canada to Patagonia.

QUESTION: *To what animal family does the coon or raccoon belong? Has it anything in common with the bear?—G. M. W.*

ANSWER: The raccoon gives its name to its family, the Procyonidae, and systematically is placed next to the bears. The raccoon has little in common with the bear excepting that it is plantigrade, that is, it walks with its heels on the ground, whereas most animals walk on their toes.

QUESTION: *Please give me information in regard to rooting the wild azalea or honeysuckle. I have tried to root cuttings with no success.—J. M. E.*

ANSWER: A publication by an eminent authority on horticulture states that this plant may be increased by cuttings of mature wood two or three inches long in late summer, placed in sand under glass. They may also be increased by grafting on other roots.

QUESTION: *I saw among some verbenas, which were in bloom, what I first thought was a humming-bird darting rapidly from flower to flower. However, I soon saw it was*

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*not a humming-bird but some kind of large bug or insect. It made a humming sound like a humming-bird and poised itself over the flowers in about the same manner.—H. W. B.*

ANSWER: The insect you saw was a sphinx moth, or humming-bird moth. There are many kinds; the one you saw may have been *Phlegethontius carolinus*. In its larval form it is the green tomato worm.

QUESTION: *Is there a green flint and a red flint, or is there only black and white flint?—B. S.*

ANSWER: The term flint is applied to a number of kinds of rock, the principal part of which is silica. Due to differences in the manner in which these rocks were formed many other substances are included, and these result in a very great variety of colors, including gray, brown, red, black, and green.

QUESTION: *Where can one obtain yew wood, and where does it grow? We wish the wood to make bows for archery.—Mrs. F. H. D.*

ANSWER: All yews are comparatively small trees and the only species in this country that seems to furnish wood of a quality and dimension suitable for bows is the western yew *(Taxus brevifolia)* which grows on the west coast from extreme southern Alaska south to California. It is nowhere a very common tree, and grows to a size and shape suitable for bows only in scattered favorable situations.

QUESTION: *On March 23, 1927, I observed a male Maryland yellowthroat in the vicinity of Philadelphia. Is this early for the arrival of the species?—H. I. C.*

ANSWER: According to the records of the Biological Survey, April 18, 1896, is the earliest record in that section for the Maryland yellowthroat. Your record therefore is very early indeed.

QUESTION: *What power is required on the microscope to clearly distinguish the red corpuscles of human blood?—R. S. V.*

ANSWER: The power required to distinguish red corpuscles varies with the knowledge and skill of the operator. It usually requires the highest power available.

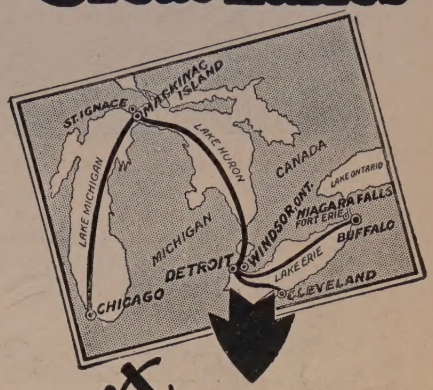
QUESTION: *How fast do the Amoebae travel? Is it possible actually to watch them move?—R. S. V.*

ANSWER: Amoebae move fast enough to pass out of the field of vision of the microscope in a very short time.

QUESTION: *Can we distinguish families of birds as we do animals? If we can please tell me how we may know the crow and bluejay are thus related?—J. H. B.*

ANSWER: Birds are divided into groups in much the same way as mammals. The crows, ravens, jays and magpies are usually included in the crow family, Corvidae. The bill is the best common character, being much the same shape in all and with the nostrils covered with bristly feathers. There are of course other structural characters.

# Vacation days on the Great Lakes

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August, 1927


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# NATURE CALENDAR

## AUGUST

by E. Laurence Palmer

AUGUST was named by the Emperor Augustus after himself. For fear that he might feel slighted by having his month only thirty days long while July named after Julius Caesar had thirty-one, the Roman Senate took another day from February and added it to August giving it thirty-one days. In spite of this ruling of the politicians of Emperor Augustus' time, the moon has continued its trips around the earth and the earth its trips around the sun on schedules set by no politicians. Men are creatures of habit, however, and in spite of inconvenience and extravagant waste we continue to recognize months of irregular length while Nature is offering us easy and convenient units of measurement. Primitive men were frequently more sensible than we in this connection. Strangely enough before we can get any general adoption of sane natural units of measuring time and space we must win the approval of individuals whose training may have been more largely in the field of human laws than of natural laws. It is not strange that there should be some conflict under these circumstances.

While there seems to be great nicety in the behavior of the celestial bodies at least of some of them there is not always a similar exactness in the behavior of living things. A human being's temperature may go a few degrees above or below the normal 98.8 degrees for example. It may be interesting in August to note the critical periods through which many living things pass in that month. Frequently we can discover why apparently attractive looking brooks do not contain trout by observing in August that the brooks are either dried up or that their temperatures have arisen above that which permits the given species of trout to continue to live. As suggested in an earlier Nature Calendar one can with reasonable accuracy determine the temperature of the air at night by the number of calls given by snowy tree crickets per minute.

The drying up of the brooks during August or any other time of year also does much to determine the kinds of insects liable to be found in the brooks at other times of the year. Those species that require a full year of life in water cannot, of course, survive such a critical period. If a real estate man tries to sell you some property over which a nice little brook runs in the spring and tells you that the brook runs the year round it might be worth your while to collect some of the forms of life in it and determine if any require a full year to complete the life cycle in the water. The tadpoles of bullfrogs and of green frogs would not be found in a pond which dries up during the year.

During August many of the smaller waterways will be covered with floating plants like duckweeds and their kind. It might be interesting for you to try to discover the flowers which these plants may bear or to determine how rapidly they may reproduce. The under side of lily pads may be well supplied during August with jelly masses that contain young snails which you can see twisting and turning if you use a hand lens. In addition these lily pads may bear the cocoons in which the water-scavenger beetles lay their eggs or you may find the larva of a little moth which makes a shelter for itself of leaf fragments.

The birds of August are much different in their general behavior from the birds of the earlier months. Nesting is for the most part done. The second broods are beginning to take care of themselves and the adults are moulting and resting preparatory to the southern journey. Strangely enough the young birds are probably those that most frequently start the southern journey to lands they have never seen. Stranger still they follow practically the same paths which their ancestors followed.

If one is looking for strange things in Nature in August, however, he should become acquainted with the habits of many of the parasitic wasps that do exactly as their parents did though their parents died before the present generation was hatched from the egg. If you have never seen a wasp attack a large spider perfectly capable and willing to kill the wasp you have a thrill in store for you. How the wasp knows exactly where to insert the poison which will paralyze but not kill the spider when it may never have seen a spider before is enough to set us all wondering. If this surprises us we have many others in store for us if we will but study the ways of almost any of the parasitic insects which do so much to save us and our plants from destruction.

The white of wild carrots will begin to supplant the white of daisies in August. The yellow of mustard will make room to some extent for the equally yellow goldenrod and the blue of chicory will begin to appear as an advance guard for the blue of the asters that is to come.

*FOR HIM WHO LOVES A DOG THE PICTURE OF A COLLIE ON A WINDY HILL IS EVER AN UNFORGETTABLE SIGHT*

NATURE MAGAZINE

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A DOG YIELDS TO US MORE THAN WE MERIT

BY HIS DEVOTION HE PUTS TO SHAME OUR OWN

# THE HEART *of a* DOG

by Ben Hur Lampman

*Illustrated by Marguerite Kirmse*

Now this was the way of it in the beginning, and the beginning must have been when the world was new and all. Our Father Adam, the first man, had for his own the first dog. And though a man from the very first, from the wonderful, misty creation of things, he had nevertheless a trace of boyishness in his heart, since legend tells us that the dog, his dog, the first dog, loved him well. It is worth inquiring into, this fable, or whatever you may choose to call it, of Father Adam and his dog.

After Eden, when knowledge set poor, quaking Adam apart from his companions the beasts, so that he wept to think on the lost days, a visible gulf widened swiftly between Adam and his erstwhile friends. On this side the gulf was Adam, his heart in his throat; on the other paced mournful tigers, and lumbered the ungainly elephant, trumpeting sadly; and in affrighted clamor fluttered the bright, tall birds. All manner of living creatures, save man, were on that side the chasm. The gulf widened and deepened, inexorably, and our Father Adam stretched out the two hands of him.

Beyond the gulf—that is to say, on the brink where beasts were—the dog whined and barked, and the echo of his dolor went ringing up and up to the young sun. Back and forth, and forth and back, along the perilous verge of the dread precipice raced the dog. Fear was in his brown eyes, and fear was in his newly awakened heart, and abject terror was in the beseeching droop of his tail—and twice he crouched, and thrice, as though to spring, but the purple deeps appalled him. And then said the dog, "Neck or nothing!" said he, and gathered his thews beneath him and with a great bound put fear behind. Lean and clean and true as an arrow he sped across the gulf, and, tail a-wagging, dropped lightly beside Father Adam to lift cold muzzle to warm hand. Beside the sons and daughters of Adam his daughters and sons walk to this hour.

So it was in the old days. If you have known a dog, as few have not, you are aware of the singular consistency of this friendship, that seems so surely to have been ordained, since it is one of the most natural of human affections, and is rewarded with such agreeable response, often beyond the due of the master. When I recall those dogs that have been mine, or others whose acquaintance was my privilege, it is to reflect somewhat sadly on the inequity of the compact. For a dog—a good dog—yields to us more than ever we merit, and by the unselfishness of his devotion puts to shame our own.

And I would say no more of this, since it is self-evident and somewhat wry to the thought.

For the breeds of dogs, their purity of lineage, your genuine dog-lover cares little. It is true that he takes delight in a well-bred dog, and that the picture of a collie on a windy hill is unforgettable to him, or the stance of a setter when birds are found; but he has learned—if, indeed, he was not born with the knowledge—to search the eyes of a dog for the heart that must surely dwell there. And that which he sees tells him what manner of dog he has met, and waives all questions of pedigree. I think this but equitable, because it is quite true that no dog, of the many I have observed, ever dreamed of questioning its master as to his birth and station.

DEAR WILLFUL, FUNNY PEDRO

Materialists are given to impatience toward those who impute to the animals the least of that reasoning faculty which marks man. As though man himself were not an animal, and a fellow pilgrim of the beasts! I have read the opinions of those who are persuaded that the dog—and the horse—lack only the medium of speech to claim a nearer place beside us, and to give startling proof of sharing in some part our thoughts. Maeterlinck records an extraordinary experience, conversational in character, with certain "trained" horses of Germany. Even his mystic's mind recoiled from the assumption, on the evidence, that there was resident behind those grave, level eyes such tenants as were comparable to the brooding something he called his soul. Amazing and disconcerting speculation!

Of horses I know little, and it is my loss. But of dogs, I know this—as all know who have had dogs for comrades—that they would speak if they but could, and that they experience the deeps of sadness and of trial because they cannot voice the words that are insistent in their thought. For repeatedly it is evident, that conversations which concern a dog, or are deserving of his interest, and are between his own people, create reactions such as one might remark in an intelligent child. You will say, perhaps, that these talks which stimulate the interest of the dog, which brighten his eyes, and excite him to barking and joyance, contain the key word or words with which he has learned to associate a motor trip, or a walk afield, or a day beside a trout stream, or the excitements of the hunt. And what are words to us if they are not keys to thought, and, again, the mediums of expression? If so be he has recognized certain words, have they not unlocked the dog's thought as surely as they unlocked ours, and is he not therefore in possession of their meaning, as are we? And further, it will be wise to observe this—that an apparent dearth of key words in this meaningful talk is often no obstacle to the dog's comprehension. Manifestly, he knows. And one, perforce, arrives at this conviction —that dogs understand, in some degree, that speech which concerns them, or that extends anticipation; and this correlative apprehension, that it is possible they comprehend many words, and the essential substance of conversations, to which they have occasion to react. Is it not probable that the thought of the dog should be: "I have no interest in this"?

An acquaintance of mine is an elderly collie of the name of "Kim". Some time ago he challenged "Tam," our own collie, to mortal combat, and the subsequent strife was epic and frightful. When we at length dragged them apart they laughed, as collies will, in warrior joyousness, and yearned toward one another with an implacable, fierce eagerness. I here recall the bickering because it both introduces these friends of mine and illustrates the well-nigh human inconsistency of the collie blood, that ordinarily is magnanimous and sane, but which hungers for battle as for a feast. This Kim collie is by way of being a certified public accountant, and his belligerency is therefore the more scandalous. Any sum in addition and subtraction within the scope of ten is a simple problem for Kim, who will give you the answer in barks. It is absurd to assume that mere training accounts for the facility with which he answers, since the available combinations in even that limited scope are many. His master takes refuge in the theory of telepathic communication—and, ah, how thin that refuge! How it begs the question! If it is the true answer, then, indeed, we have a marvel; and if it is not the true answer then is the marvel greater.

Now, "Tam" cannot count, nor add, nor subtract, and it would perhaps be futile to attempt the teaching. But he knows when we speak of an absent one and draws near to share the talk, and his eyes are luminous when it is Friday night—because it is on Saturday that we go into the country—and he is well aware that it is treason and shame for the cat "Chester" to look over long at the canary "Peter." And shrill is his wail if you rebuke him, as occasionally is needful—yet in conflict he is silent under punishment as any Modoc. And if you have a secret that he may not share, and which concerns some enterprise dear to him—keep silent when he is near, or spell the words. Nay, banish the thought itself from your mind, and the reflection of it from your eyes—or he will stand trembling before you, tensely,

THE EXCITEMENT OF THE HUNT

pitifully eager for the event promised. Such are dogs.

Of the wit of dogs, among scores of comparable instances, I recall the episode of Pedro and the pintail drake. Pedro was a brown water spaniel, whose years with us began when he was quite lost and helpless in the track of an overshoe. For that was in the Dakota country, where drifts are heavy and overshoes large and competent. When autumn crept over the cottonwoods and the lithe willows, and thrice ten thousand birds wheeled and shone above the sedges, he learned instantly to retrieve and brought his first mallard to shore as would a veteran. His spirit was such that he would break his way through a hundred yards of young ice to gain the bird that had fallen far out. And the comely prairie, the musky odor of marshes, the wingbeat of a hurtling flock—these were all in all to him, these and his people.

It happened that one October evening, when Pedro was yet a novice—though a novice he never was—I had killed a shoveler cleanly in passage, and, standing beside a neck of water that linked two lakes, saw in the rushes of the farther shore the alert head, motionless, of a drake pintail. He was in trouble of some sort, I could see, a shattered wing that held him still to earth and denied to him the welcome whirr of flight. Marking the spot I started on my way to the bird. The pintail flashed for a moment among the sedges, and lay hidden—to die slowly, or to fall a prey to talon or fang, unless we might reach him and end the cruel business. To gain the sedge where the pintail lay—for the spaniel had not observed the bird, and hence might not be sent—one must circle the lower lake, a distance of perhaps half a mile. My chosen way was to the northward and the wounded drake lay screened to the south. The shoveler I hid beside the path to await our return. Pedro glanced at the duck, and then at me, with questioning and reproachful eyes. It was not so the game was played. Of what profit was it to retrieve a bird and then to leave it on the prairie? But I whistled him on, and he followed.

At length, having circled the lower lake, we reached the rushes of the neck, and at my bidding he found the wounded bird and brought it to me. There was haste in his manner, and a certain obstinacy in his eye. As he dropped the drake, he wheeled and went lumbering down the shore—for the spaniels run heavily and without grace—the huge ears of him rising and falling, and falling and rising, most ludicrously. "Heel!" I called sharply. "Pedro!" It was vain. The yellow grass closed over his agitated tail and he was gone on his own affairs—and on mine. For I knew his purpose, and when half way around the lake again was far from astonished to see the stubborn fellow stumbling hurriedly toward me, the abandoned shoveler in his mouth and in his bearing the consciousness of duty done. "There," he seemed to say, as he cast the bird at my feet, "is the drake you so stupidly forgot. Ah, what would you do without the excellent Pedro, my friend? Who else has your interests so surely at heart?" Dear willful, funny Pedro, whose brown soft scrutiny has so often searched my face—is there good hunting, and are there golden prairies and rustling marshes, where you dream the long dream?

To the courage of dogs no tribute here is needed, and such tales as I might tell must seem pallid beside the shining record of their essential valor. Yet after all the simplest narrative, so casual as almost to enter the commonplace, may serve as well as any to relate the gallantry of the dog, that instant renunciation of self which is sib to the valor of the seaman who yields his plank to a messmate, and so fares down and down to death in the green heart of mother sea. True courage connotes the putting aside of fear, the mastery of the base emotion—which is elemental as life's sources—by a prompting so fine, so selfless, so argent, that it might

well be summoned from beyond the stars. A paragraph, then, to Mac the cocker spaniel, ebon of coat, wistfully waggish of eye, and possessed—through some queer cosmic prank—of a shivering dread of deep water.

At the first, nothing might persuade him to venture into stream, or slough, or lake. There was terror in his look, and his affrighted legs trembled at the brink. A curious inhibition! But Mac was Mac, and he could not readily be another dog. And his first plunge, wherein he cast fear from him—verily believing that it was at the risk of his easy, humorous, contented life—was taken in a misguided effort to save his friend from the wholly fanciful perils of the old swimming hole. He scored my back with his entreating paws, as he urged me to return to that dear shore. And I turned, petulant at his folly, and thrust him beneath that terrible water—which was passing cruel of me. Rising he renewed his efforts to save, and his insistence was so difficult to deny —what with reddening weals upon a sunburned back, and his great terror and devotion—that at length I swam to shore. I see that agitated glance, backward over the curly, ebon shoulder, as he led the way, inexpertly, hastily, in churning foam. Saved! The warm shallows under us, the ripened rushes clicking round us, and the spaniel a glistening shower of spray.

In this manner Mac entered into his heritage as a dog, and though it cannot be said that ever he learned really to love deep water, at least it may be reported that he schooled himself to endure it. And once in later years—though this is another story—he was swirled down a rapids of the Peace river, wherein he had capsized a canoe, and emerged with comparative nonchalance after a half mile of roaring water. When his dripping master gained his side, lamenting the loss of food and rifle, the spaniel already had treed a bob-cat, as one who must needs be industrious though the heavens fall. It was not I who swam the Peace, because of the untimely gambols of Mac. But I find myself regretting, for a variety of reasons, that it was not. The first of these is sufficient in itself, since the farewell that we exchanged when he left for the north, where astounding adventures awaited him, was the end of our intimacy. I never saw him after. Years ago he must have entered sleep. And it is a strange trick that memory plays me. For the resilience of his remembered coat presses against my arm, and I seem to see a white tooth bared in laughter. A cocker spaniel, ebon and curly, a dog that feared deep water. Observe. He has joined the excellent company of those who in their times, and as need was, made conquest of fear.

As to the humor of dogs, they are in this, also, patterned after the human heart. There are dogs that are dour from puppyhood, and dogs that forever are in the doldrums, quite as there are dogs that bear about with them, on all their affairs, a grave dignity, pontifical or judicial, from which no circumstance may win them. But, happily, there are dogs that are wags and jesters, that are the Depews of their kind; merry, laughing, laughable fellows that scent a jest as far as they may wind a mutton bone. And in a majority of dogs a discerning and delightful humor waits only the occasion. One has seen the dog weep; slow tears that coursed, from unaccustomed and meager ducts, down the sad countenance. Wherefore dogs have the foil of laughter. The lifted, humorous lip, the dancing eye, the rolling tail—these are an earnest of sincere, though not always innocent, merriment.

Of flame and fellowship was Pat the setter woven, and he was always the lad for a quiet laugh. The coat of him drew fire from the sun, burning gloriously to every shifting muscle, for he was red as morning and the light loved to rove over him. And his heart was warm as his coat, and full as sunny; and I could wish, if beggars might ride, that we two were this hour beside the Rogue together, and he laughing to feel the joy of life, or solemnly considering the manner in which I played a fish. Well, to be brief, Pat had a way of thieving stale buns from the baker, who would not

MAC WAS THE SOUL OF COURAGE

have cared had he known. So craftily, so stealthily, to the door of the shed where these minor loaves were to be had in prodigal numbers. Paw up! Ah, slowly, lad! Paw down! Ah, softly, dog of my heart! Now, seize upon them—warily! warily! You have them fast in white teeth, a baker's dozen; a rare prank at his expense! Paw down! Paw up! A red silence blinding. Run, Pat! Ah, run!

The scalawag, He did not know what hunger was. He was round as a puncheon. He was larded as a friar. But he thought it sport to thieve the baker's second-day buns, and at safe distance he would toss them high, scatter them, fall upon them, fling them singly, and laugh and laugh, and laugh! He did not understand that the baker was done with them, or at best would have given them away to ranchers for their hogs; and not for a heavy purse would I have disillusioned him, had this been possible. Perhaps we were rascals both. Let it pass. I for one would not come between any dog and his jest, if that jest has no sharp edge to it.

In those times when the pretzel might be had, before a twilight descended on this comestible, as you might say, Pat came by one in honest fashion. It was a veteran of its species, flinty and obdurate, and he did it no harm. He consigned it to gravel beside the depot wall, and straightaway forgot that he was lord of a pretzel. And the weeks lengthened into months, and the months drew onward to a year, and he paused on the hillside one day and begged me to grant a brief absence. He said that he had but then remembered a most pressing affair, a matter of moment, as I must understand. And, "Yes, Pat," I said to him and he shone redly down the slope. Well, it was the pretzel,—his pretzel—and from afar I marked the flying gravel, the thrusting muzzle, the swift return, head high, plume streaming. His eyes brimmed with laughter as he flirted the mouldy morsel to the path before me, and his flanks shook with mirth as he asked me if I remembered it. The joke, it seemed, was on him. Not talk? Not laugh? Sir, where Pat is there are speech and laughter, and the mirth is clean.

Yes, indeed. Also, touching the matter of fidelity, it is told in a Norse saga that Olaf Paa gave to Gunnar, as a great gift, the Irish hound Samr, who was held to be the equal in valor and prowess of an able man fully armed. You may well believe that Gunnar was pleased with the gift, and the more so, while he stroked the smooth head and fumbled at the soft, warm ears, to hear Olaf Paa say this of the dog: "He hath a man's wit and will bark at thine enemies, but never at thy friends. And he will see by each man's face whether he be well or ill disposed toward thee, and he will lay down his life to be true to thee."

There is a dog sleeps under our cherry tree—deep down, far down. He was Pat. Since always there is a time when one must do this last service for a good dog, I think it a good place in which Pat sleeps. But there is one best place in which to bury a dog. One place that is best of all. If you bury him in this spot, the secret of which you must already have, he will come to you when you call—come to you over the grim, dim frontiers of death, and down the well-remembered paths, and to your side again. And though you call a dozen living dogs to heel they shall not growl at him, nor resent his coming, for he is yours and he belongs at your side. People may scoff at you—people who see no lightest blade of grass bent by his footfall, who hear no whimper pitched too fine for mere audition; people who may never really have had a dog. Smile at them then, for you will be knowing something that is hidden from them, and that is well worth the knowing. The one best place to bury a good dog is in the heart of its master.

# The STRATEGY of THE SHRIKE

by Edgar Marshall Graves

OVERHEAD flew a loggerhead shrike and I paused from my work of excavating in one of the aboriginal villages near Montgomery, Alabama, to watch the bird. It was carrying something in its bill and perched on a honey locust tree, proceeding to make quick and peculiar pushing motions as though trying to attach or detach something. Knowing that the loggerhead was reputed to store up its extra supply of food on thorns and barbs, I determined to get the evidence for myself.

Sure enough, the shrike had just placed a large grasshopper on a thorn, but seeming to suspect me of an appetite, the bird reclaimed its meal and departed. Only a glance at the locust tree, however, showed twelve other large hoppers,—eleven of them alive,—impaled upon thorns. The curious point was that each grasshopper was imprisoned in exactly the same way, with the thorn forced into the hard part of the chest and through the back between the wing connections.

Later I returned with two Montgomery naturalists, Dr. R. Pearson Burke and Ralph P. Eagerton, to photograph the loggerhead's cupboard. Three of the hoppers were missing, possibly having made a breakfast for the shrike, but eight of the nine remaining insects were still alive. The accompanying photographs show them well. One would think that Nature had endowed the loggerhead with the instinct to know how to impale its prey and in such a way as to keep them from death at once.

THE WATERFALL ON CANVAS

*One of the many views of small cataracts and cascades in the romantic landscapes of Jacob Ruysdael*

# *The Romance of* WATERFALLS

by Charles Fitzhugh Talman

WATERFALLS came into fashion with the arrival of the Romantic Movement in art and literature, and their vogue has never abated. Every year something like a million tourists make the pilgrimage to Niagara; as necessary an experience in the education of an American citizen as the journey to Mecca is in the religious life of a Mohammedan. How many visits are paid annually to other celebrated cataracts throughout the world it is impossible to estimate. Each of these natural wonders has its peculiar charm and its special claims upon the attention of the traveler, so that one might range far and wide over the globe for a lifetime without exhausting the catalogue of their attractions.

The romantic appeal of waterfalls has been greatly enhanced in our own generation through demonstrations of the marvels their once wasted energy is able to accomplish when converted into electricity. A cataract that was once merely a spectacle to be enjoyed at close range is now a fountainhead of both useful and beautiful activities spread over hundreds of square miles. Even where the waters have not yet been "harnessed," imagination conjures up the vast and manifold blessings that will flow from them in the future. Hydroelectric engineering has not only invested waterfalls in general with a new interest,

U. S. GEOLOGICAL SURVEY

BURNINGTOWN FALLS, NORTH CAROLINA

*"Some like a downward smoke,*
*Slow-dropping veils of thinnest lawn, did go"*

but has created a host of artificial waterfalls, some of which are almost the compeers of Niagara in majesty and beauty.

How does Nature fashion her waterfalls? At first sight the answer to this question seems easy. A stream, you may say, in wandering over the country comes to the edge of a precipice and then simply drops off. Nine times out of ten it does not happen that way. Most waterfalls are made by the streams themselves. The bed of the stream is constantly worn away by the sand and gravel carried along in the current, and the softer parts of the bed are worn faster than the harder. Thus a stream that originally has a uniform slope acquires irregularities that may develop into waterfalls.

Some falls do begin with the flow of water over previously existing cliffs and some are formed by the damming of a river with boulders brought down by the stream or its tributaries. But, however the cataract gets its start, the steady grinding of the rocks brings about great changes in its form and even in its location. Sometimes the abrupt fall is converted into a gentle slope, and the cataract disappears. This came near happening at St. Anthony's Falls on the Mississippi at Minneapolis. As these falls were needed for water power purposes, they were protected with considerable labor and expense and thus artifically preserved.

At Niagara the river above the falls flows over a bed of hard limestone, beneath which lies soft shale. At the foot of the falls the waters cut the softer rock back under the limestone, ledges of which are left projecting without support. From time to time these ledges break off, and thus the cataract is rapidly receding. The seven-mile gorge below its present location is the record of its past recession. The larger of the two cataracts at Niagara, known as the Horseshoe Falls, is now receding at the rate of about five feet a year. The travel of the American Falls is much slower; only a few inches a year. The time the cataract has taken to cut its way back to its present site has been much discussed among geologists, whose estimates vary from 7,000 to 70,000 years.

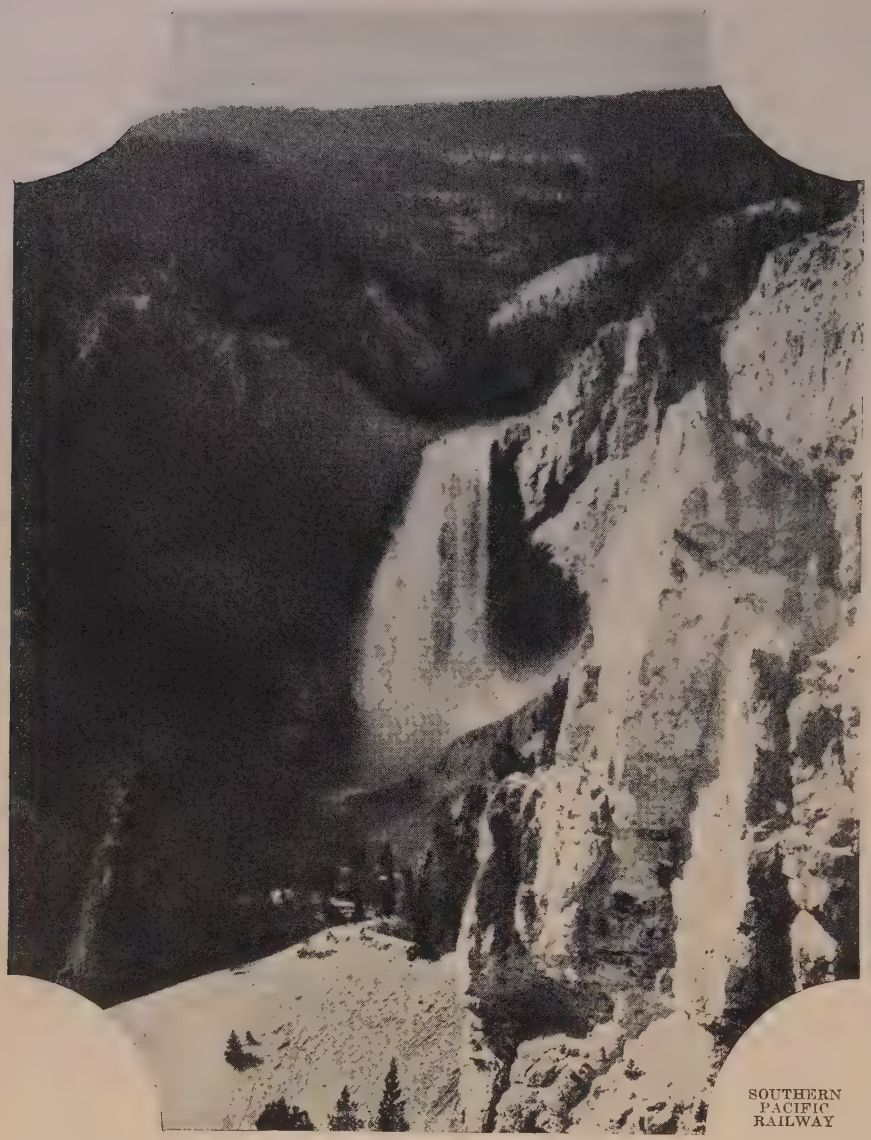
In view of the many scientific problems connected with waterfalls it is a remarkable fact that their study has not yet acquired rank as a distinct branch of science. Glaciology, the study of glaciers, has its numerous specialists, its textbooks and its journals. There are whole libraries devoted to volcanoes and earthquakes; big scientific institutions give their entire attention to oceanography; mountaineering is both a sport and a science, with its host of devotees; and even caves have given rise to a separate science of speleology; but there is no "-ology" of waterfalls. Even the Germans have not evolved one! No scientific man has been especially distinguished as an authority on waterfalls, nor, so far as I am aware, has any amateur pursued the hobby of visiting waterfalls all over the world and taking pictures of them. Who will found the first Waterfall Institute?

That the study of waterfalls has important bearings on the history of the earth's surface is self-evident, as is also the fact that exact data concerning them are needed by hydraulic and electrical engineers. A less familiar fact is that for more than a century studies have been made of the electrification of the atmosphere in the

U. S. GEOLOGICAL SURVEY

WATKINS GLEN

*"And some thro' wavering lights and shadows broke*
*Rolling a slumbrous sheet of foam below."*




LOWER YELLOWSTONE FALLS AND YELLOWSTONE CANYON

*The gorgeous coloring of the rocks, contrasting with the green of the pines above, is the special glory of this cataract*

neighborhood of cataracts. Why the air for hundreds of yards around a big waterfall carries a strong charge of negative electricity was a mystery until the discovery of the "Lenard effect" about thirty-five years ago. Lenard found that when drops of water are broken into spray there is a separation of positive from negative electricity. The water retains the former and the adjacent air acquires the latter. This discovery has since become of great interest as a means of explaining the origin of lightning in thunderstorms.

Waterfalls also afford an opportunity of studying rainbows more perfect than those seen in the sky, because the bows formed in the spray of a fall are often complete circles. The bows seen in the huge masses of vapor rising from the Victoria Falls, in Africa, are described by one writer, Colonel Molyneux, as the crowning spectacle of this famous cataract. He says:

"At every turn and in every view of the water, green foliage and dazzling foam, the glorious double rainbow follows one, whether in the rich prismatic colors of the daytime or the neutral tints of the moonlight. What wonder that the more ancient native name of the cataract was 'Seonge,' the place of the rainbow, for here surely all the rainbows of the world must come to play in the sunlight."

The vibrations set up in the rocks by waterfalls have been studied, and recently some measurements have been made of the noises produced by the waters of Niagara. The latter exploit, carried out by the promoters of a device intended mainly for testing the noisiness of industrial operations, revealed the fact that at Prospect Point, on the brink of the American Falls, the din is less deafening than that prevailing at some of the busiest street corners in New York City!

There has been a good deal of discussion as to which of the world's great cataracts is best worth seeing, and opinions will probably always differ on this subject. Niagara is, at any rate, the most famous. Moreover, no other cataract affords such a variety of thrills and interesting experiences. Besides gazing upon the sublime descent of the waters, one can venture underneath them, in the Cave of the Winds; skirt their outer edge, on board the "Maid of the Mist"; and view from a car window their tumultuous journey down the Whirlpool Rapids, which some visitors find as remarkable a sight as the falls themselves. The spectacle of the falls in winter dress, with their mountains of frozen spray and their icy stalactites and stalagmites, is unique among natural wonders, since none of Niagara's rivals among the world's mighty waterfalls is found in a climate capable of producing such a sight.

Neither is there any other waterfall that performs such astonishing feats of latter-day magic through the medium of electricity. Contrary to a general supposition, by far the greater part of the electrical energy generated at Niagara is not used for driving machinery or yielding light, but for providing the prodigious heat required for the manufacture of such substances as aluminum, carborundum and artificial graphite. Probably nothing else connected with Niagara is quite so romantic as the electrochemical industries that have arisen on its banks.

In wild grandeur Niagara is doubtless surpassed by several other cataracts, and above all by the stupendous Victoria Falls of the Zambesi, discovered by David Livingstone in 1855. Here a mile-wide river, flowing along so peacefully that boats can approach with safety the immediate vicinity of the fall, is suddenly plunged to the bottom of a chasm cleft at right angles to its course. The depth of the chasm is from 260 to 400 feet, and its width is from 80 to 240 feet. The water escapes through a narrow gorge opening from the opposite wall.

Unfortunately this cataract is so hemmed in by the crevasse into which it falls that only part can be seen from any one spot, and the view is further obscured by the spray, which ascends in clouds more than a thousand feet high.

Another cataract that stands in the first rank is that of the River Iguazu, on the border between Brazil and Argentina. It is half again as high as Niagara, though not so high as Victoria, and it covers a larger area than either. Higher than all three are the Kaieteur Falls, in British Guiana, where there is a vertical drop of 741 feet, as compared with 167 feet in the American Falls at Niagara.

All the cataracts above mentioned are broad as well as high. Much greater heights are found among the slender falls of the "bridal veil" type. Mr. F. E. Matthes, of the United States Geological Survey says of these:

"Among them the Yosemite Falls appear to stand foremost. The entire chain of falls and cascades that the waters of Yosemite Creek make in their descent from the upland to the floor of the Yosemite Valley is 2,565 feet high. The individual measurements are: Upper fall, 1,430 feet; intermediate cascade, 815 feet; lower fall, 320 feet. There is, so far as I can ascertain, only one waterfall that exceeds the upper Yosemite in height—the Sutherland Fall, in New Zealand. It measures 1,904 feet in height, but it is broken about midway by projecting ledges and makes no clear leap of more than 900 feet. The falls of Gavarnie, in the Pyrenees, are, according to some authorities, 1,385 feet high but they consist of braided streamlets that slide down the seams of an irregularly sculptured cliff and do not fall clear through any notable height."

SAN JOAQUIN LIGHT & POWER CORP.

A MAN-MADE CATARACT RIVALING THOSE OF NATURE

*Many of the grandest waterfalls in the world are the work of the engineer. This is the Kerhoff Dam on the San Joaquin River, in California*

Waterfalls have inspired many glowing descriptions, in prose and poetry. Lord Byron immortalized the artificial falls of Terni, which M. Curius Dentatus constructed for the practical purpose of draining a lake that had caused troublesome floods. Southey's well-known jingle about the cataract of Lodore is much more remarkable than the waterfall itself. Tennyson's "wild cataract" that "leaps in glory," his "slow-dropping veils of thinnest lawn," and his

"wreaths of dangling water-smoke
That like a broken purpose waste in air"

are unsurpassable word-pictures of waterfall types.

Longfellow named the imaginary heroine of "Hiawatha" after the Falls of Minnehaha. Thus it came to pass that a comparatively unimportant cataract, which would otherwise have enjoyed but a local renown, became one of the most famous in America.

Ruskin, with his usual obsession, tells us that no artist but Turner ever knew how to paint waterfalls, and he gives, in "Modern Painters," an instructive analysis of the visible features of a cataract. There are, however, some captivating little falls and cascades in the canvases of the Dutch master of landscape, Jacob Ruysdael.

The folklore of waterfalls is strangely meager. In that huge repository of myth and legend, Frazer's "Golden Bough," there are only a few brief references to waterfalls. In Basutoland the natives believe that the bottoms of chasms into which certain cataracts fall are haunted by spirits in the shape of gigantic snakes. The Oyampi Indians, of French Guiana, imagine that a monstrous snake lies hidden under every waterfall, and that to see it is fatal. Canoe and Indians are then dragged down to the bottom and devoured by the monster. "The Oyampis," we are told, "never name a waterfall till they have passed it, for fear the snake at the bottom might hear its name and attack the rash intruders."

MALE BIRD JUST AFTER THE "STRUT"
*Note the dropped wing and the alert attitude. The "neck wings" cover and protect the thin skin of the distensible air sacs*

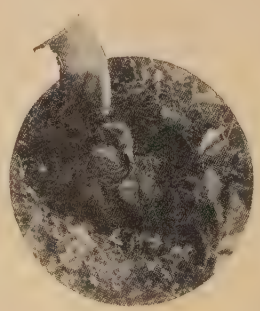
# The TRAGEDY of the HEATH HEN

by George W. Field

THE EARLY explorers of North America found on the coastal plains, from Cape Ann to Virginia, in large numbers, a bird which in appearance, voice, and habits somewhat resembles what we now call the barred Plymouth Rock hen. The name "Heath-Coke," (or cock), was given to it by the new settlers on account of a superficial similarity to the grouse known in Europe as the heath cock. This is now better described as the "Black Game," and has been widely advertised through the wearing on certain Scottish uniforms of the black, handsomely curved tail-feathers of the male bird.

Specimens from Virginia and possibly from eastern Pennsylvania were examined, and in 1758 were described by Linnaeus, the great naturalist, as "a grouse with feathered legs, body barred to the neck; the neck equipped with feathers in imitation of wings." Later, this bird was distinguished from other grouse by naming it as "the one with drums on its neck," that is, Tym-pan-u-chus. These drums on each side of the neck are when distended almost the size of a tennis ball, with thin, orange-colored membraneous walls. They appear to serve as resonance cavities, giving volume and carrying power to the birds' mating call.

This call is a peculiar toot given both in one and in two syllables, decidedly musical, reminding one of a full, round musical whistle from a distant steamer. It can be imitated well by means of a six-ounce glass bottle, about half filled with water. By repeatedly modifying the quantity of water, one is able to match the pitch and volume to the call of the birds. By slow, careful blowing, in considerable volume, but avoiding excess of force, a reasonably successful duplicate of the "toot" may be obtained. Thus we are able literally to bottle and preserve in glass the call of the heath hen. But, except for this bottled variety, the call of the heath hen can be heard today only in one place in the whole world. That place is the center of the island of Marthas Vineyard, off the coast of Massachusetts.



ON THE NEST

The heath hen is one of several species which have been more or less the victims of "civilization." Among these are the great auk, passenger pigeon, and Carolina paroquet. Only a few heath hens are still living. Shall the species be permitted to join those that have been wantonly destroyed by "civilization"? Responsibility for the extermination of a species is not to be carried lightly!

Like its cousin, the prairie chicken, the heath hen was early hit by settlement. As early as 1708, the state of New York sounded the danger signal, and enacted a close season law, which made shooting between April and October illegal. In spite of the fact that similar legislation followed in New Jersey in 1820, in Massachusetts in 1831, in Rhode Island in 1846, the

MALE BIRDS STRUTTING ON THE SKY LINE

*Each attempts to drive the other males from the area which the first comer has preëmpted*

range of the bird became constantly more restricted, resulting in isolated colonies in the few places still remaining favorable for the birds. Records are in print of "fine bags" made on the breeding grounds in southern New Jersey in the fifties. So, too, it is recorded that the very last heath hen on the mainland was killed near Barnegat, New Jersey, in 1869.

By a biological accident, a few birds were left on Martha's Vineyard. This island, formed by the great glacier out of the best of New England has since its origin remained a choice spot biologically, a providential haven for life. Free from foxes, raccoons, opossums and wild cats, it was exceptionally favorable for maintenance of the original inhabitants, of which the heath hen, locally called He'th'en, has always been given special standing by the broadminded and hospitable citizens of the island. The town records show that in 1823, "transient persons,"—people from "America" or elsewhere, to use the natives' term for "off islanders,"—were forbidden to shoot heath hens within the town of Tisbury. The records further show that it was "voted, that there be a fine of five dollars levied upon any person or persons that shoots any heath hens within the town of Tisbury."

A STURDY HEATH HEN CHICK

*The young are able to run about actively a few hours after hatching*

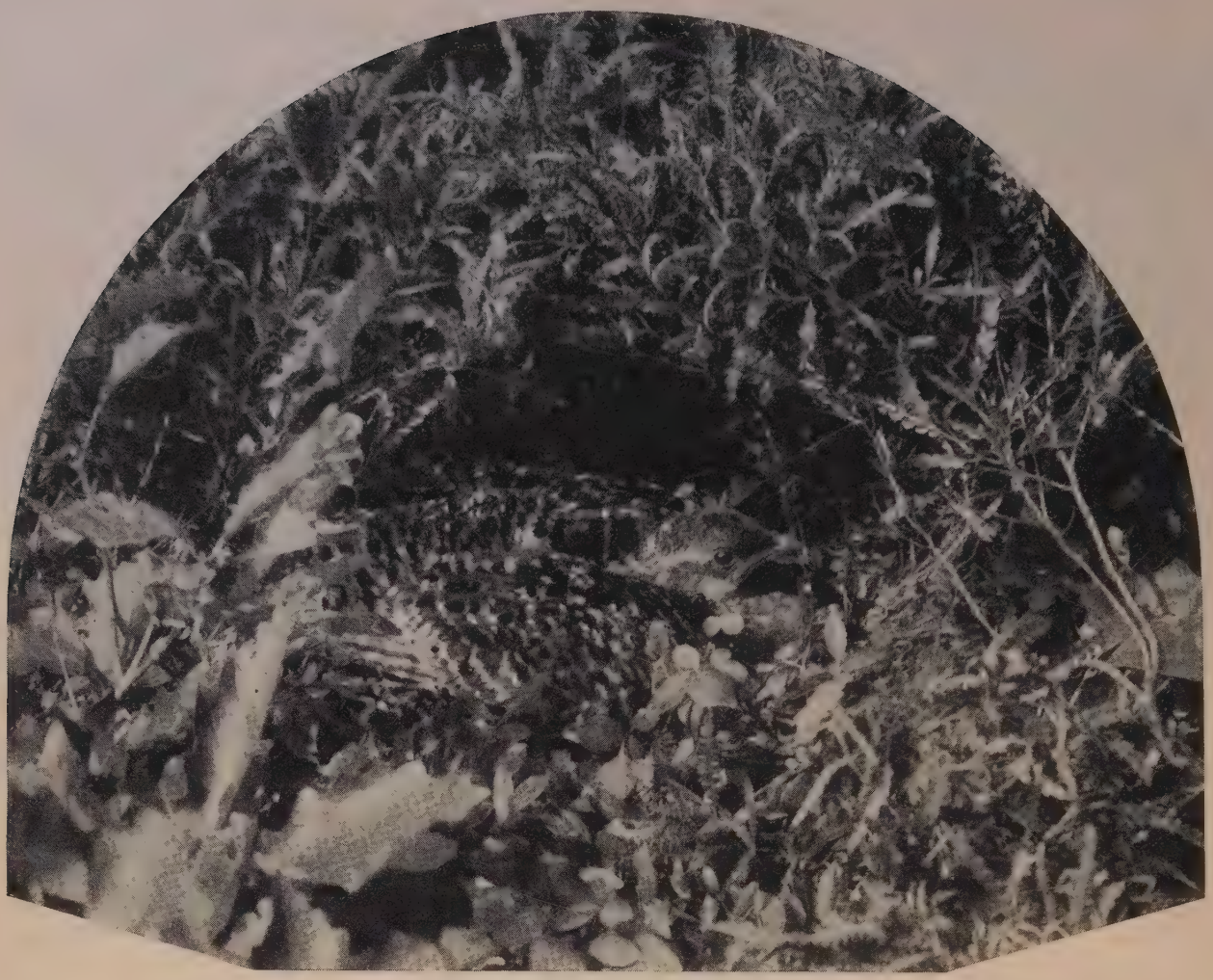
When the biological records of the entire tier of states from Virginia to Massachusetts were officially examined in 1906, by the Massachusetts Commission on Fisheries and Game, the town of Tisbury alone was able to show evidence of wise and honorable trusteeship in behalf of our bird. Here, alone, in all the world could one see a living heath hen! But, even there, from the scrubby wilderness, horizon-wide, came to the spring-time rendezvous only twenty-one birds, and those in great majority, males. With such a small nucleus could the species be saved?

Again the people of Tisbury rallied. The other towns on the island, and a good majority in the Massachusetts Legislature, joined in supporting the "wise Ulysses" representing the town of Tisbury, and the laws were enacted necessary to initiate on the island the project known as the Heath Hen Reservation, perhaps the first successful application on this continent of the reservation method for maintaining grouse.

Here the birds increased under the favorable environment provided by a typical farm. The first notable setback was during the winter of 1911-12, when there was an estimated loss of a hundred and fifty heath hens, practically one-half of the number in existence. With a change in the warden personnel and in the crops planted, the annual increase of birds was again resumed. Forest fires were systematically guarded against, and by May, 1916, the lowest estimate was eight hundred birds, with a possibility of fifteen hundred, or even more. It was a common experience to see seventy-five to a hundred or more, by actual count, in flight or at rest, at once. The early ratio of ten to twelve male birds to one female had become reduced to not more than three or four males to one hen.

The spring rendezvous had then become a matter of interest. To see it many people visited the island in early spring. It was felt that the heath hen had been re-established and with a future reasonably secure. Unfortunately, the bird does not lend itself satisfactorily to public exhibition. The annual convocation and spring dancing is not easily accessible to spectators. Even the townspeople have relatively little first-hand knowledge of this bird, and in some instances, are reported to have evinced disappointment that the "boom" of the mating call of the heath hen has not brought a real-estate boom to the town. Moreover, the question was promulgated, "What good is the heath hen, anyway? Would it not be better to make the reservation available for increasing the quail and pheasant shooting?" Then followed the *laissez-faire* period from 1917 to 1924. But the true measure of a community is its response to civic responsibility. This re-

"CHARLESTONING"



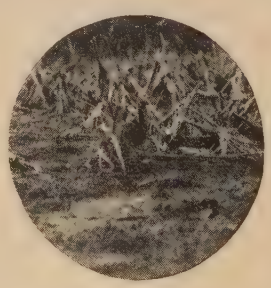
THE HEATH HEN'S NEST IS ON THE GROUND

*The devoted mother bird sits on her eggs for twenty-four days covering them with leaves when going off to feed*

sponse has not yet been lacking in Marthas Vineyard, and the record is now clear and decided in favor of continued loyalty to the heath hen.

In spite of the disastrous results of a forest fire which, in the spring of 1917, devasted the reservation in the midst of the nesting period, followed by great loss of adult birds through excessive exposure to enemies, as a result of the loss of the protective vegetation, the call of the heath hen may still be heard. It is believed that the small nucleus still to be seen there today is sufficient for a "come back," and that the causes which so nearly exterminated the bird in past years, may be controlled and averted. A census in March, 1927, however, made with as much care as possible, indicated that there are probably fewer than thirty birds on the island. But interested observers are today on Marthas Vineyard carefully watching every chance to extend a helping hand to the last survivors of the heath hens.

In order to see the performance actually on the stage, one must arise while it is yet dark, and be concealed in the outdoor theatre where the birds are accustomed to make their rendezvous. Of these special gathering places, several were formerly known. The accompanying photographs were made during the period of increasing numbers, between 1910 and 1916 at the largest of the three dancing grounds, all of which were formerly within the Reservation. To interpret properly the photographs, we must imagine them with an early spring-colored background, on a gently rolling plain, horizon-wide. On the east, in the foreground, a typical cornfield, with occasional hills planted to Russian sunflowers, and at the last cultivation sown broadcast with clover, buckwheat and turnips; the corn now partly in shocks, but for the rest a wild tangle after the storms of winter. Into this tangle come the birds to pick a few kernels from an ear of corn, a sunflower seed or two, a taste of buckwheat, supplemented by a salad of clover leaves, spiced with the tender newly-sprouted leaves of the turnip, all making up the "balanced ration" which all wild creatures know instinctively how to make. Like good Americans they prefer corn "on the cob" and even neglected to pick up loose kernels when fed by scattering on the ground. This cornfield was in the Spring the favorite feeding and loafing place for the birds. It was veritably the "Rialto where they most did congregate," instead of wandering precariously over all the island. How well the protective coloration of the birds harmonized with the bent and broken vegetation!



FIND THE BIRD

The remainder of the clearing was a typical "mowing," where one could count the birds by scores and even hundreds, as

MRS. HEATH HEN IS RETIRING

*The female keeps her feet on the ground, and is rarely seen*

MR. HEATH HEN STEPS OUT

*The strutting male in all the glory of his spring-time regalia*

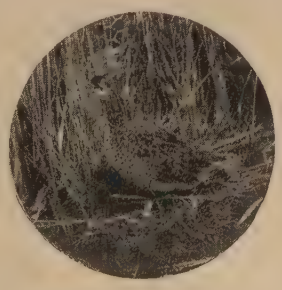
they "went on the air" with their tootings, and cackling, laugh-like calls, making a bedlam of peculiar animate sounds, rarely to be heard outside the tropics. This also was one of Nature's athletic fields; physical supremacy was determined by sparring with beaks and feet, by foot races, high-jumping, in bewildering rapidity. Snapshot photographs catch the birds warding off blows by using one wing as the Roman gladiator used his shield, or doing steps which shame the modern dance. The "neck-wings" are seen to serve as shields to protect, while the birds are fighting, the delicate membraneous air sacs on either side of the neck.

All this and more might be seen from the concealment of the imitation corn shock which had been provided for the comfort and efficiency of observers. Surrounding a space sufficient for three persons with cameras and chairs, the framework of wooden posts and chicken wire was covered securely with corn stalks, with openings left sufficient for purposes of observation and photography. Occasionally, birds would light on the roof. Such unconscious familiarity was annoying, for if one caused the unsuspecting intruder to fly too suddenly, his flight was certain to be interpreted by all the nearby birds as a danger signal, and all left in a body. Then followed a long wait, or more frequently, the session was terminated, as the most activity was shown by the birds for only about an hour at sunrise and before sunset. In referring to the birds alighting on the cornshocks, "he" was used advisedly, for the females were rarely, if ever, seen to make themselves conspicuous. They generally keep their feet on the ground, and this shyness of the female doubtless must be considered in estimating the relative number of males and females.

Let us attend the first performance on a typical April morning. With the first gray of dawn come the heath hens, singly on foot, or more often flying in small flocks. After a brief period of feeding, they begin to take their stations in the open field, and the ball opens. More birds continue to come in from all directions, some belated, but still on foot, but more with the characteristic flight, a series of rapid wing beats, alternating with sailing on set wings.

On alighting, each bird disappears from sight, squatting until convinced of the absence of enemies, when he arises to his feet and becomes an active participant in the veritable medley of struttings, posturings, scrapings and "scrappings," dancing, tooting, cackling, cracking, screaming, fighting, all for the purpose of impressing the female of the species that he is a "regular fellow." It appears obviously the purpose of each male to "run off" every other male from the area of perhaps fifty feet in diameter, to which he has preëmpted claim. The fight is never to the death, and rarely with shedding of feathers or blood. Each appears to realize "that he who fights and runs away, may live to fight another day."

Some of the rapid succession of poses and details of the strut were caught and fixed by the camera. One misses, however, the "Charleston"-like rapid short footsteps, which beat a tattoo on the ground so violently that it can be heard by the human ear fifty or more feet away. So, too, one loses the conspicuous white flag formed by the white under-coverts of the uplifted and expanded tail. These recognition marks flash in all directions over the field and must be exceedingly conspicuous to other distant birds seeking the rendezvous. The bright orange-colored air sacs expanding and disappearing on the neck, give a notable bit of color to the scene. So, too, flash in the near view the orange-colored "eyebrows," looking as if made with a modern, though yellow, eyebrow pencil, and giving a peculiar made-up appearance to the interesting birds.



SEVENTY DAYS OLD

With the waning of the courtship days in April, the nesting season waxes, and normally reaches its height early in May. From eight to eleven eggs are incubated for twenty-four days. The majority of young appear to be hatched normally between May 15 and June 15. Later broods occur as a result of delayed nesting, or of destruction of the first eggs. The nests are found but rarely, for the reason that the female covers the eggs with leaves for protection during her absence, and sits remarkably close during incubation. Her coloring so closely matches the environment as to make her practically invisible unless she is almost stepped on. Her close application to the business in hand has proved to be a factor in the destruction of the race, for there is evidence that the devoted mother refuses to leave her young, even when unhatched, and perishes on the nest with the advance of the forest fire. Thus, as has happened where some thoughtless person has started a woods fire by carelessly throwing away a lighted match, cigarette or cigar stump, or intentionally made a burn to increase the crop of blueberries for next year, large numbers of the females and young are likely to be destroyed. This may be inferred to have led to the undue proportion of male heath hens on the island.

The just-hatched young rely upon protective coloration to escape their enemies. After a few hours they begin to go on their own and are well-nigh invisible in their frozen squat. The legs, strong for running, are within a week or ten days supplemented by the growth of rigid and long primary wing feathers, so that when occasion arises, the small birds can scale for considerable distances over and through the brush. In about seventy days they reach full size, but are still clothed in the juvenile plumage. Like that of the young bobwhites, this first feathering is characterized by the longitudinal stripes of lighter color along the mid-ribs and on the periphery of the contour feathers. But before winter comes the adult plumage is assumed.

These birds are a sturdy race, surviving storms of sleet and cold which decimate other species. Able to feed, if need be, upon the needles and buds of the pitch pine in winter when such tasty foods as army worms, beetles, dried blueberries and small fruits and grains are not available, it is a type of our hardy ancestry. Why is it, then, that this race has not prospered? Is its decadence the result of its own actions, or failure to conform to changing environment?

The answer is found in birds cut down in flight by telephone wires; some few may still be shot in "mistake for rabbits," or in a failure of a few gunners to meet a proper standard of civic responsibility of respect for law; failure to recognize that laws are not part of an elective system, which a citizen may choose which ones he shall obey. In instances, the price paid by collectors for skins of heath hens has tempted, in some, the uncontrolled impulse of a good shot, but far above all these are the destructions wrought by natural enemies. A noteworthy case is that of the marsh hawk. Elsewhere this hawk is a species useful to man and to agriculture by its war upon mice and other small rodents. Here, doubtless on account of the peculiar, low, dense, tangled shrubbery, it is unable to catch sufficient mice and small rodents and is therefore compelled to resort to small birds, or even some of considerable size, for prey. In any event, the stomachs of forty-three hawks, killed on the island, were examined by Dr. A. K. Fisher of the U. S. Biological Survey, and disclosed evidence of either young heath hens, or insectivorous birds, in all except three. At one marsh hawk's nest, we found the remains of one flicker and parts of four chickens and of two heath hen chicks.

But most serious of all is the fact that large numbers of our domesticated cat (which, one remembers, is the same species that in its wild state still ranges parts of the Old World) are cruelly abandoned by the summer cottagers as they leave the island. Many of these cats thus left behind are compelled to live off the country, and finding congenial cover, wander into the heath hen country and there resume the wild habits of their ancestors.

Obviously, none of these conditions are the fault of the heath hen. It is perfectly adapted to everything except what man can control, but which he does not. This failure is not willful on man's part, but due to a thoughtless lack of responsibility. It can be remedied.

The heath hen, on Martha's Vineyard, can be protected against unfavorable conditions, whether these be Nature-made or man-made. Diseases contracted from domesticated and introduced birds, or the potential destructiveness of motorized and armed mankind, or of natural enemies, though necessarily to be regulated, may be inconsequential in comparison with the two major factors for evil which man can control, on the island, cats and fire.

Much popular interest and appreciation continent-wide exists in the maintenance of the heath hen. The Portuguese have an ancient proverb, "Kind words butter no parsnips." In the case of the heath hen, more than kind words are needed to save this species.

Would not the sight of a living dodo, a great auk, or of the only native United States paroquet have been worth all the total cost of a suitable reservation? Renewed nation-wide attention should be given to the development and maintenance of reservations, not only for the heath hen, but also for the Pronghorn or other species of wild life now threatened by civilization.

*For a century and one half the Surf-bird has been known to ornithologists, but bird students who have traced the flutter of its wings from the Straits of Magellan to Sitka, Alaska, sought its nest and eggs in vain. It was a bird of mystery until, at last, Joseph Dixon of the University of California, who had made five pilgrimages in search of the elusive nest, solved the riddle. He tells of his success in the September issue of Nature Magazine.*

MRS. BORER
*She is larger and more robust than the male moth*

# The Peach Tree Borer

By A. B. Champlain

MR. BORER
*The male is more slender with an inch wing expanse*

HOLDING HIGH rank among the insect enemies of the peach is *Synanthedon exitiosa,* better known as the Peach Tree Borer. It is a native species found in the United States east of the Rocky Mountains, and its original food plants were undoubtedly some of our wild cherries and plums. Since the introduction of the peach it has showed its preference for this host, and orchardists are obliged to wage continual warfare against it to save their peach trees from destruction. On the Pacific Coast the Peach and Prune Root-borer, *Synanthedon opalescens,* takes its place as an enemy of stone fruits. The habits of this western species are similar to those of the peach tree borer, and remedies for its control are practically the same.

These insects belong to a family of clear-winged moths that in the adult state are remarkable on account of their resemblance to wasps and hornets. This resemblance is carried to the point of mimicry in their actions as well as in their appearance. Even their motions, when disturbed, suggest the stinging wasp-like insects. They may even pretend to sting when handled, but we need have no fear of them on this account as they are not equipped with stinging organs, nor can they bite.

Male and female moths or adults of the peach tree borers are quite different from each other in appearance, and might be mistaken for two distinct species by the uninitiated. The female is larger and more robust than the male, of a shining deep blue or purplish color, and with a broad orange colored band around the abdomen. The forewings are dark, the hind ones are transparent, except for the margins and veins, and when spread they measure an inch and one-half across. The male is more slender, similar in general color to the female, excepting the orange band which is lacking, and has in addition numerous yellow and lighter markings. Both the fore and hind wings are clear, and their expanse is about an inch.

These moths love the sunshine. They fly for a short time during the summer days, and have no other object in life than for the males to find a mate, and the females to find a peach tree where she deposits her eggs on the bark, usually at the surface of the ground where her young will find food. She then goes her way to die.

Eggs of the peach tree borer are of course very small, just about one fortieth of an inch in length; they are oval in shape and yellowish-brown in color, while the surfaces are finely sculptured or roughened. They are laid by the parent moth during midsummer, and may be observed at that time with a magnifying glass on the bark of the trees where they have been glued to the surface singly or in groups. Several hundred eggs may be deposited by one female, and after about ten days they are ready to hatch.

Newly hatched larvae or caterpillars have no thought beyond eating, and they chew their way through the bark until by touch and taste they find the succulent inner bark or cambium, where they feed steadily through the summer and well into the fall. When winter comes, they suspend operations and go into hibernation in their burrows which have been continuously enlarged by the growing caterpillars. With the advent of spring, they resume their activities, making tunnels and burrows while feeding, sometimes completely girdling the trees, and consequently doing great injury, or even causing the trees to die. Brownish or amber-colored gummy exudations, mixed with earth and debris

FULL GROWN LARVA OF BORER
*Shown at left in section of peach bark. At right, cocoon with empty pupal shell projecting*

about the base of the trees, are indications of the presence of the caterpillars working inside.

Full grown caterpillars or worms are about an inch in length, they are yellowish-white in color with brown heads. It is in this state and condition that they are best known to peach growers, and who would believe that these wormlike caterpillars will eventually become active winged moths?

Of all the strange and interesting facts in the life of an insect, there is none that is quite as wonderful as the change from one stage to another. The caterpillar, so totally different from its parent, is now ready to go into the intermediate stage, which is different from either. It must now be completely reconstructed, and in preparation for this change it leaves the tunnel and creeps to the surface where it gums together a cocoon of powdered wood and grass lined with soft silk, in which it lies snug and safe. Inside this cocoon the remodelling takes place and the pupa is formed. Lying snugly housed inside the cocoon the pupa spends about three weeks in quiet seclusion. Then it pushes itself partially from the cocoon, the pupal shell splits, and from this case there appears an adult or moth. As soon as the wings have expanded and dried, it flies away into the sunshine of June or July.

Up-to-date peach growers gas the borers with paradichlorobenzene, a comparatively new treatment that is used to control the pest in trees three years or older. Paradichlorobenzene, or P D B as it is abbreviated for convenience, is a white crystalline solid somewhat resembling flake napthaline. When applied in proper amounts around a tree in a ring or circular band several inches from the base at all points, and covered with soil free from grass and weeds, in the shape of a low mound extending five or six inches above the surface, and left over the winter, we may expect an almost complete control of the pest. Paradichlorobenzene, which changes to a gas that is heavier than air at temperatures above 55 degrees Fahrenheit, will poison the insects.

DEFENSE AGAINST THE ENEMY BORERS
*Tree surounded with Paradichlorobenzene in a mound about the base, discourages attack*

Complete information on P D B, including time of application, dose and methods of procedure, may be found in certain publications of the Federal and State Governments. The Pennsylvania Department of Agriculture issues General Bulletin Number 383, by T. L. Guyton and J. R. Stear, in which a complete and comprehensive account of the use of this chemical and other remedies for the peach tree borer may be found.

Cutting and destroying the worms or caterpillars in September, and again in the spring, or "worming" the trees as it is called, is a popular remedy with many growers. It has the disadvantage of somewhat disfiguring the trees, but if the grain is followed when cutting, no serious injury will result. It is an effective means of eradicating these pests in the younger trees, and also the older ones, when P D B is not easily available.

THE SLENDER TOOTHWORT
*An attractive flower of the mountains of the south Atlantic states. It has a peppery root*

THE SERIOUS LITTLE PRAIRIE OWL
*The author and one of her later pets, to whom a grasshopper was a subject for much ponderous study*

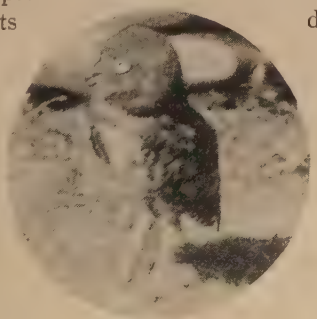
# CONFESSIONS *of a* PET-LOVER

## "A Criminal Habit," says the Family. "A Joyous One," Says Lorene Squire

*Photographs by the Author*

"WHEN I was very young" I began adopting pets. I was not particular—practically any kind of animal would do and, my parents testify, did do. Once I had adopted and named my pet I upheld and defended it throughout its career of deeds and misdeeds, mostly the latter. And when a pet came to an untimely death, as they had a habit of doing, I conscientiously saw that it was buried only after a solemn and tearful funeral.

Four years old, I began with a trio of ducklings presented by a well-meaning relative. There followed a pair of rabbits and a bull terrier pup. Then as I grew older I acquired my own pets, fairly revelling in crawdads which I kept in an aquarium dug in the back yard. There were also turtles, pigeons, toads, pollywogs, a goat, a bantam rooster and more rabbits.



SOBERSIDES
*Some still believe the superstition that prairie owls and prairie dogs live happily together*

By ten I was adopting every stray cat in the neighborhood. Those cats were usually the most disreputable-looking felines but after being fed and, yes, even shampooed, they became fairly respectable.

My parents had stood in quiet resignation when the crawdads appeared. They had even smiled good naturedly at the toads, pollywogs, turtles, the bantam rooster and even the goat, but when the number of cats reached thirteen they objected. Pleading that although thirteen cats were enough cats they were absolutely not too many cats, I won temporarily until one morning two good-sized litters of kittens were

discovered in the garage. The next morning, much to my concern, they were gone. Then the cats began to die mysteriously, and there were twelve funerals with all the children in the neighborhood as mourners. One cat remained —a three legged one at that.

As time went on I developed a love for wild animals. My dreams of owning a cougar, buffalo, porcupine or bear were no doubt prompted by a ravenous absorption of Seton's books. The climax came when I read Ernest Harold Baynes' story of adopting a timber wolf. I simply must have one!

My oratory, however, failed to move the family with a similar enthusiasm for such an addition to our household. It was "preposterous—ridiculous —unheard of—not to be considered!" So my proposition was vetoed by a unanimous vote.

NEVERMORE AND SOBERSIDES

*The family named the crow in the hope that nevermore would there be pets*

Then a few weeks later there came the chance of a life time—the opportunity to procure an opossum, which, of course, I did. He possessed a discouraging amount of intelligence and a temper. I secretly used the electric washing machine as a cage—a brilliant idea, I thought, until washday came—which ends the story of the opossum. It was a very sad event and for a time quite dampened my enthusiasm to own a wild animal as a pet.

My next pet was not a wild animal, but a fox terrier pup named Donald, but, at that, he made any wild animal seem very tame by comparison. The misdeeds of this dog's feather-brained existence have become history in our family. How he ever lived to a sane old age is a mystery to me.

One day the cook came into the library, wildly gesticulating and trying to say as many words per minute as was humanly possible. At first I thought one of the family was injured but after she began to calm down I discovered it was something about Donald.

"You don't mean to say, Katy, that he's killed?"

"No, he ain't but he's going to be." Then she began rocking back and forth and wailing, "He ate me rolls all exceptin' one and—"

"K-Katy, do be sensible. Tell me about it."

"Well, I put a pan of rolls on the door of the oven to raise and sure when I went into the pantry that onery pup of yours swallowed 'em. All of 'em exceptin' one and he might just as well—" (This was interrupted by a series of yelps and yowls from the kitchen) "That's him and I hope to goodness, miss, that thim rolls just start risin' in his stomach and he swells up and busts!"

I reached the kitchen in three steps. At sight of Donald I collapsed. There he was looking like a black and white balloon, with four tiny legs and a head fastened on, running around in circles and yelping at the top of his voice. Then seeing the kitchen door opened he rushed out and down the street accompanied by a series of yelps.

Three days went by before we saw Donald again. One morning he appeared at the kitchen door, assured himself that Katy was not making rolls and entered. Katy finally forgave him,—he had lost his appetite for rolls—and he lived on to what the newspapers call a ripe old age.

CUTIE WAS FAVORITE OF THEM ALL

*His property ravages were widespread but his disposition was always charming to those who loved him*

Next I adopted a young crow. The family named him Nevermore in the hope that nevermore would I have any more pets. That crow roamed the neighborhood at will, tore up gardens, pestered cats and chickens, squawked from morning till night, ate mulberries, peaches and cherries, fought blue jays and made himself generally undesirable.

During the year that I kept him, Nevermore did not learn to caw but made an unearthly noise best defined as a squawk. Finally Nevermore's wing, which I clipped, grew out and one morning he was gone. He probably returned to his kindred of the prairies. So at dusk in autumn when crows are sailing overhead to their roosting place in the cottonwoods I hear a squawk among the many caws and like to believe that it is Nevermore calling to me from high above.

Next comes Cutie, my pet prairie dog—a little imp with snapping brown eyes. He had the greatest intelligence, most unusual qualities and interesting ways of all my wild animal pets. But the family never did appreciate Cutie. After he had dug up a flower bed, gnawed a Chinese rug, torn half the cotton out of a mattress and ruined a fur coat, I believe they really disliked him.

Cutie was a little warrior. He put cats and dogs to flight by similar tactics, although I cannot understand why they were afraid of him, except that he was fearless. As time went on Cutie's ravages on property became more and more serious. It was plain that I had to choose between a cage for Cutie or ostracism. I chose the former, but soon found that the happiest creature I had ever known was beginning to mope when confined. So with many a heartache I planned to take him out to a prairie dog town. Would the instincts of the wild return to him in his native environment and would he become again a normal prairie dog? The answer I shall never know because Cutie escaped from his cage, and discovered rat poison in the basement. I mourned his death more than that of any other of my pets.

One day a boy telephoned asking whether I wanted a young chicken hawk. I did, of course.

Hash, as I called him, was immediately placed in the chicken yard, then uninhabited by chickens. He was safe there for he had not mastered the art of flying enough to get over the fence.

Hash was not a very affectionate pet—cold, proud and fearless, scarcely deigning to notice a lowly human being. He perched in a small tree and came down only now and then for food.

One day Dad, forgetting all about Hash, put five chickens in the yard. The next morning the chickens were gone. Hash was suspected—in

fact proclaimed guilty and I was on the verge of buying five more chickens when the discovery of a hole in the fence and the escaped chickens farther down the street proved Hash's innocence. This saved his reputation, and he and the chickens lived peacefully together till his wings grew stronger and he was able to fly away.

Then there was a tiny prairie owl, dubbed Sobersides, that some children brought me. This owl took life very seriously. Even a small grasshopper was a thing to ponder over solemnly for at least five minutes before being eaten. A large cricket required about fifteen minutes and a mouse a half hour or more. At last when the tiny owl was able to fly I returned it to the prairies.

And so I come to the last of my pets—Horatius, a half-grown skunk. He was the best natured of them all and treated by everyone with the most distant respect. The little girl next door and I were all that had any confidence in Horatius. She often took him out of the cage, petted him and fed him milk out of a bowl into which Horatius would nearly climb.

Horatius had such a satisfied self-assured way about him—always happy and good natured—but he also had a way of patting his two front feet on the ground to warn away intruders when he was eating.

Then one morning Horatius escaped from his cage. But he still remains in the garden. Everyone in the neighborhood feels that he should be caught and removed to a distant part of the country,—the more distant the better. All are in a state of nervous suspense as to the possibility of Horatius using his efficient power of defense. But for obvious reasons no one has the inclination to capture him. And so Horatius goes his happy way unmolested, making frequent raids on neighbor's chicken coops and although protests are made definite action to get rid of him is indefinitely postponed.

Horatius is the latest. The next is a matter of speculation with me and of dread on the part of the family.

AN EARLY PET
*(Above) The possum with the brief temper*

BELOW IS HORATIUS
*He was treated by the neighbors with distant respect*

*Miss Lorene Squire will contribute another entertaining article, illustrated with her own pictures, to the September issue of Nature Magazine. She is possessed of the patience necessary to the wild life photographer, which accounts for the excellence of her pictures, and, happily, she is able to write as successfully as she can snap the camera shutter.*

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# Those Whimsical Wasps

by Edward G. Reinhard

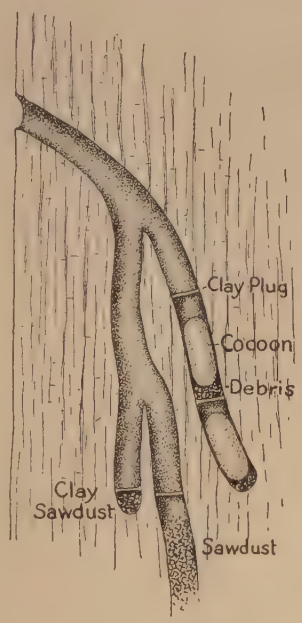
Do you know the tupelo, that straight and strong-limbed tree sometimes called the sour gum or Nyssa? It is a dweller by brooksides, a sentinel on rocky knolls, but conspicuous above all in the autumn woods when its oval leaves are tinted with strong maroon. That foliage, so brilliant in its burning hues makes a mass of color that blazes from afar off. At a distance the tupelo seems clothed with a wonderful rubicund mantle of royalty. But stand at her elbow and the princess' raiment will often be revealed as a ragged cloak that is sadly blotched and worm-eaten.

A RACE OF AMIABLE GNOMES

*The solitary wasps who hunt and hoard, build and breed in independent way*

During the summer a horde of legless caterpillars have been gnawing away at the foliage of the Nyssa, not along the margin or upon the surface of the leaves, but deep within, feeding as it were on their delicate marrow. The caterpillars are so small and flattened that they find no difficulty in tunnelling between the upper and lower surfaces of the leaf. Here they subsist luxuriously on the green parenchyma that lies between the colorless layers of epidermis. Here indeed is a nursery that is well stocked with soft and wholesome food.

The mining caterpillar need not leave its mine. Within the leaf, there is found protection as well as food. The epidermal layers are transparent, they allow the sun to warm the naked worm. They are tough besides. The rain cannot wash the legless infant away. Poison sprays would beat harmlessly against the windows of its abode. The walls of leaf-tissue appear strong enough to keep the most enemies at bay. The dusky micro-moth, *Antispila nyssaefoliella,* whose larvae are the leaf miners of the Nyssa, seems to have cradled her offspring in a sanctuary that is perfectly safe and secure.




HOME OF SYMMORPHUS

*The mother walls up her infants to protect them from enemies*

But Nature is inexorable. No creature is exempt from the law of predatism. Every species pays its tithe to the treasury of some more powerful stomach. Every piece of vitality is subject to immolation as food for Nature's multitudes. So it is with the leaf-mining caterpillars of the Nyssa. They are the predestined food for the larvae of a tiny little solitary wasp, *Symmorphus debilis.* Thus while Antispila is sacrificed, Nyssa is accorded relief.

What a delicate little wasp Symmorphus is, with its long, thin thorax and low waist-line, in entire length less than three eights of an inch. De Saussure named it "debilis" because it is so "small and extremely slender". It wears no distinctive garb, only the ordinary black and yellow uniform common to many kind of wasps.

Symmorphus is so delicately fashioned, so dainty, so quiet in temperament, that I was well pleased to find her nesting in a very charming situation. There is a half wild garden on the slope of a hill through which trickles in late summer the remnants of a stream that slips between smooth boulders of granite, laves the roots of a solitary beech and a trio of tupelo trees, and then spreads itself into a marshy pasture at the foot of the hill. Ensconced in a corner of the garden is a rough-hewn cedar bench beneath an arbor of climbing roses. It is a sort of poet's bower, rustic, redolent, inviting inspiration. To this retreat I would often come with a book as comrade to read in the quiet of the afternoon and when weary of dead type to watch the winged harvesters of pollen and the gay sippers of nectar among the tangle of rose briars overhead.

In one of the wooden uprights which

"A LUSTROUS PENDANT OF PEARL"
*The egg of Symmorphus dangled from the wall like a sacred jewel*

supports the roof of roses two Symmorphi were dwelling, each having established an independent hermitage half way up the wooden cliff. Every now and then a little midget of a wasp would pop out of the post, drop something, and pop back again. She came from a round opening in the timber, as regular and as ordinary a hole as the bore-mark of a small auger. This was the entrance to her dwelling and from the chambers within she was removing little loads of fine sawdust to drop them out into the gulf beyond the door.

While one wasp was sweeping house, the other was loading up her larder with pieces of game. Just as a flicker with a grub in its bill darts into the hollow tree, so the little wasp would arrive at her hollow in the post with a caterpillar carried tightly between her jaws.

Her foraging trips were brief and frequent. She had only to fly a dozen yards or so to the trio of Nyssa trees, tear one of the leaf-miners out of its leafy chamber, sting it and bear it off to her nest.

Though it was easy to snatch the caterpillars from their leafy cradles, and the rape involved no risk, Symmorphus had to work long and diligently to provision her nest. A single Antisipila leaf-miner is so tiny a morsel that the wasp was forced to capture a score or more for each one of her larvae.

I coveted further knowledge regarding the home life of this wasp. For acquiring this a sharp jackknife was indispensable. By carving into the wood the brood chambers within were exposed to view.

On September the fifteenth one of the nests was laid bare. There were nine separate chambers belonging to this dwelling. Most of these were still crowded with the flat, pallid caterpillars, those chalk-white forms marked with a single charcoal streak down the back, that had been snatched from the interior of Nyssa's leaves. One of these hollows held a store of twenty-four caterpillars, another held twenty-six.

In five cells, suspended by a silken thread there hung a lustrous pendant of pearl. It dangled from the wall like a sacred jewel before which a heap of victims was being offered. It was a sacred thing because it was a living thing, a drop of germ-plasm enclosed in a translucent urn, the egg of Symmorphus. For these as yet unborn deities the scores of victims had been sacrificed.

One cell was still in process of being prepared, but the remaining three had been invaded by bandits. The wasp's egg was gone, the rich store of food devoured, and four or five intruders were sprawling about in each of the sacred enclosures. They were short, maggot-like creatures, the larvae of the Hymenopteron, Monodontomerus who had killed the children of Symmorphus, usurped their precincts, and stolen their food, in a spirit of Saracenic murder and pillage.

The wasp's egg, so strangely suspended from the wall of the cell, will hatch five days after it has been placed in the nest. A tiny larva wriggles out of the lower end. It does not drop into the heap of food and proceed to gormandize, but practices a more restrained form of table etiquette. Suspended by the shell of the egg which still surrounds it like a skirt, the larva hangs head downward and starts nibbling at its provender. Born in mid-air at the end of a filament, during the first period of its life it does not leave its tether. Its tail clings to the shrunken egg-shell. When the natal slough is cast, that is merely slipped off to the rear and serves to lengthen the suspensory cord so that the larva can gnaw at another portion of its food which before it could not reach. But later on when the larva has acquired strength enough it boldly descends into the midst of its heaped-

up victims and devours them.

Eight or nine days after hatching, all the provisions are consumed. Then the larva spins a light, tiffany bag of yellowish silk which adheres closely to the wood of the cell walls. In this cocoon it rests after its exertions, grows dormant, hibernates and then changes to a pupa the following spring from which a full-fledged Symmorphus will be educed according to the usual laws of insect transformation.

While at first I gave the wasp credit for being a skilled architect in wood, I soon discovered that Symmorphus was not carving out her own apartments but was using the channels in the timber made by the wood-boring grub of an elongated beetle of the genus *Tenebrioides*. Such a procedure lightened the labor of the mother wasp but brought peril to her offspring. I once saw a beetle grub, that had wandered into one of the cells from a branch gallery, in the act of devouring the wasp's pupa. The head had been chewed off and the thorax was being emptied of its contents.

The deserted channels made by the coleopterous wood-borers are first cleaned out by the tidy Symmorphus. Then a floor is made for the first cell by fitting a plug of clay into the tunnel. The space above is filled with caterpillars. An egg is attached to the side wall. Then a ceiling of clay is added and the mother's solicitation for her offspring is at an end. This ceiling becomes the floor of another cell and so the series is continued.

SNATCHED FROM NYSSA'S LEAVES

*Chalk-white larvae gathered to serve as food for the babies*

Poe's character in "The Cask of Amontillado" walled up his enemy in an alcove out of hatred. Symmorphus walls up her infants out of maternal solicitude. Man imprisons man to achieve the destruction of life. Insect imprisons insect to achieve the undisturbed development of life.

*Symmorphus debilis* is a member of the Odynerus clan of solitary wasps. The Odyneri are noted for their varied and strange habitations. That thrifty or, perhaps, lazy tendency which leads Symmorphus to utilize ready-made tunnels in wood is also a characteristic of other Odyneri. It sometimes brings them to build in what seem to us to be amusing situations.

I know of one Odynerus which found that the hollows of several large spools in a tailor shop made excellent apartments. By partitioning the tunnels with clay she converted each spool into a three-storied nest. When the mystified tailor poked from his spools a batch of green caterpillars, one could not blame him for suspecting his apprentice of playing a silly joke.

The Odyneri who build their nests exclusively of clay also take advantage of situations which lighten their drudgery. One "nervy" wasp entered my room and constructed a mud nest on the top edge of a book between the protruding covers. The depression had only to be roofed over. Since the book was a dull treatise on dialectics I allowed the wasp to appropriate it, hoping thus to derive from the insect more knowledge than I did from the author. A home built on a foundation of solid philosophy should be a happy one, but an enemy was at the door in the shape of a furry fly. This evil spirit entered the little domicile, and the wasp's nest became the abode of maggots.

The Odynerus is no respecter of antiquity. In Egypt an Odynerus, by building its mud nests in the stone furrows of hieroglyphic writing, obliterates the graven inscriptions and confounds the archeologist. Neither is she a respecter of sanctity. In a quiet chapel near Poughkeepsie there was a wooden statue of St. Stanislaus. The Odyneri garnered their prey and filled the half closed hands of the statue with brown caterpillars. This was an offering that might have been accepted, for even the widow's mite is not despised. But when the wasps stuck

their caterpillars into the ears of Stanislaus and then walled over the orifice with mud, it must have sorely tried the patience even of a wooden saint. It was my hands which removed the indignity, and I hope this act brought down upon me the saint's grateful blessing. What amazing stories and superstitions might not have gone the rounds of the countryside if some ignorant rustic had found the caterpillars in the statue's hand or seen the wasp enter the saint's ear!

Those whimsical wasps, what amusement they offer. The hornets and yellow jackets, they who live in a social state, can be on occasion irritable vixens with a red-hot, electric temper. Dangerous communists they are, ever ready for fight. But the solitary kinds who hunt and hoard, build and breed, each in its own independent way, suffer with a Quaker's forbearance our attempts to observe or interfere in their affairs. They are a race of amiable gnomes. To visit them through a magnifying glass is to meet with adventures as entertaining as those which befell friend Alice through the looking-glass.

# The PINYON JAY

by P. B. Peabody

THE PINYON JAY of the mid-western conifer belt is a bird of "whole-blue," with a few whitish chin-feathers. It has the beak and legs of a veritable crow. This jay is mostly solitary in its easterly nestings, but often communal in the West.

On conifer-bearing canyon slopes the pinyon jay lives. Here are his feeding grounds, his roosting thickets and his nesting fastnesses. But he makes frequent forays into the open under wintral hunger-stress. Still, I have seen large flocks on open reaches of Wyoming, even within the breeding time. These jays feed largely upon pinyon nuts and acorns, but in Wyoming I have found them making winter raids upon the stacks of ranchers, for they are fond of oats.

These they eat by holding a single oat on a perch, between the feet, and hulling out the kernel. This I have seen deftly done even by a bird the tip of whose lower mandible was missing. Often in April, while eagerly toiling the canyon slopes in quest of new bird thrills, I have been amused at hearing the "Kray-rer-turt-turt" of small flocks passing overhead, their throats gorged with refuse from the town as they sauntered toward their nestlings.

While noisy enough otherwhere, in nesting time the pinyon jay is uniformly silent near his nest. This is the more notable because this jay flocks, while nesting, quite like the true crows.

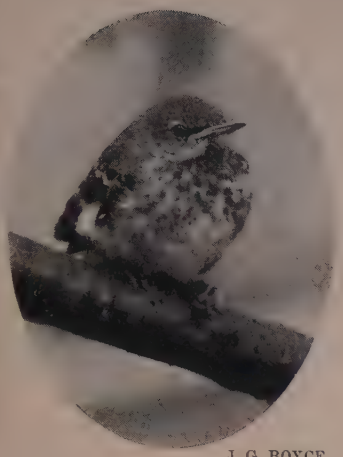
So cleverly is the nest hidden, and so like the pine needles amid which it rests, that there is even a tradition among ranchmen that the pinyon jay never makes a nest! The pine-trees chosen for the nesting are usually mid-way up the slopes, with sites most often on the mid-way branches. Out a little way from the trunk the nest is placed, so cleverly nestling amid upright twigs that it defies any storm that may sweep the heights. Twigs and plant-stems, with inner layers of rootlets and hempen fibre, make up the nest. The four or five greenish-white eggs bear faint markings of lilac-grey. Most of layings are in April, with a few in late March and belated ones in early May.

P. B. PEABODY

PINYON JAY ON HER NEST

*Here the mother bird is shown "freezing" at the sign of danger*

In the photograph will be noticed the high-headed attitude of the mother pinyon jay. This curious trait of "freezing" is rare among all adult birds, but very common among nestlings. Precocious bird-babies, on foot, do this at warning notes from their parents. Many parent birds may be gentled, at nest, but in this case there was not gentling, though the camera was at three feet.



J. G. BOYCE
MOCKER'S FIRST OUTING
*Almost ready to seek his fortune in the world*

# *In Midsummer with* TWELVE BIRDS

by Carra E. Horsfall

J. G. BOYCE
BROTHER GOES TOO
*Young mockingbird making up his mind to fly*

HOT SUMMER as well as cold winter offers opportunity to serve the birds. A pan of water on the lawn or a rockery bird-bath will draw more varied patronage than the feeding tray on the window-sill in winter. Who can say which is the more welcome to the guests?

August is the month when some of our summer residents prepare to leave for their winter homes. Swallows, swifts and martins gather in great flocks at twilight to sweep the sky of insects, until, as dusk deepens, swifts drop from sight into some cavernous chimney, swallows vanish over the marsh, while the martins seek their tree-top roosts. This is the foregathering of the clans soon to wing their way to the far southern feeding grounds.

But some of our birds do not leave us. A full, clear whistle resounding through the frosty air of a winter day, a flash of brilliant red against the snow-covered landscape, proclaims the presence of cardinal grosbeak who stays the year round in the land of his choice. He is an ideal spouse, guarding the nest during the absence of his mate, carrying food for the young and finally taking over their entire care when they leave the cradle. Meanwhile his mate builds a second nest in a vine or bramble bush. It is loosely woven of twigs, grass stems and strips of bark. Here another set of three or four speckled eggs is incubated. All this time the male bird keeps up his cheerful song and watchful solicitude for his family. He also serves the community well by destroying some of its most injurious pests, potato beetles, rose chafers, scale insects, or boll weevils. During the winter months he ekes out his livelihood with buds and weed seeds.

ALVIN PETERSON
AT THE OLD SWIMMING HOLE
*Mother rose-breasted grosbeak takes a dip in the garden pool*

Red-winged blackbird is widespread and locally known by different names. His bronzy-black coat is ornamented with red epaulets, variously bordered, while his mate's dress is of streaked brownish-gray with no bright trimmings. The family residence is built of swamp grasses and rushes lined with finer material of the same sort and firmly fastened to the strong stems of cat-tail, tule, swamp alder or willow. There are usually four or five brown-pencilled bluish-white eggs. Though redwing is censured for helping himself to grain, let us remember that nearly seven-eighths of his food is weed seeds, or insects injurious to agriculture.

*"Whip-poor-will, whip-poor-will, whip-poor-will,"* —the synchronic cadence rises and falls in the early dusk. Dusk turns to dark, soon to be pierced by moonlight. Still the wall of sound rises high in the calm still air. On the morrow one may hunt in vain for the musician, for unless accidently flushed from the leafy floor of the woods, he blends so entirely with his surroundings as to be indistinguishable. If, by chance, the female is forced to leave her two eggs, she flutters a short distance and feigns lameness to distract attention from the nest. This accomplished, she takes to flight and quietly vanishes from sight. Being entirely nocturnal in habits, whip-poor-wills are exceedingly useful in the destruction of moths and night-flying beetles. They are found throughout eastern North America during the summer months, but spend the winter from the southern part of the United States to Central America.

Far overhead three or four birds are flying erratically about, when suddenly one of them falls directly toward the ground as though a wing has crumpled. For a breath-taking moment it seems that the bird is doomed, then a hollow booming sound is heard, the line of fall curves to a horizontal and a nighthawk ascends again to join his fellows in their hunt for insects. In early morn and long into the evening hours they continue the good work. The toll is an enormous number of injurious insects, not

MOURNING DOVE—*Zenaidura macroura carolinensis*

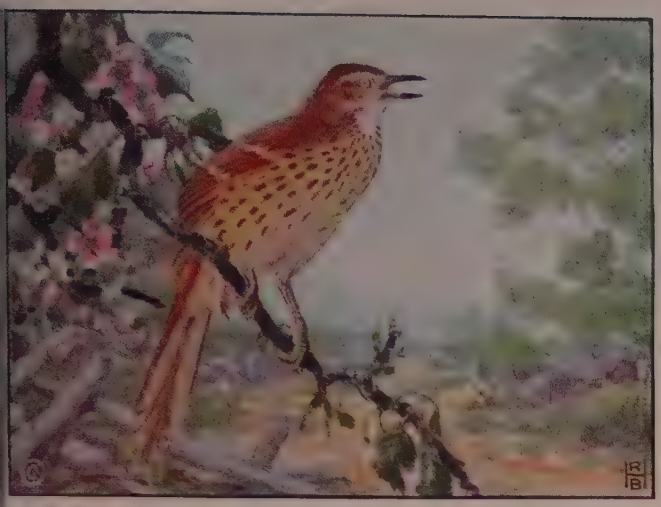
WOOD THRUSH—*Hylocichla mustelina*

ROSE-BREASTED GROSBEAK—*Hedymeles ludoviciana*

MOCKINGBIRD—*Mimus polyglottos*

NIGHTHAWK—*Chordeiles minor*

WHIPPOORWILL—*Setochalcis vocifera*

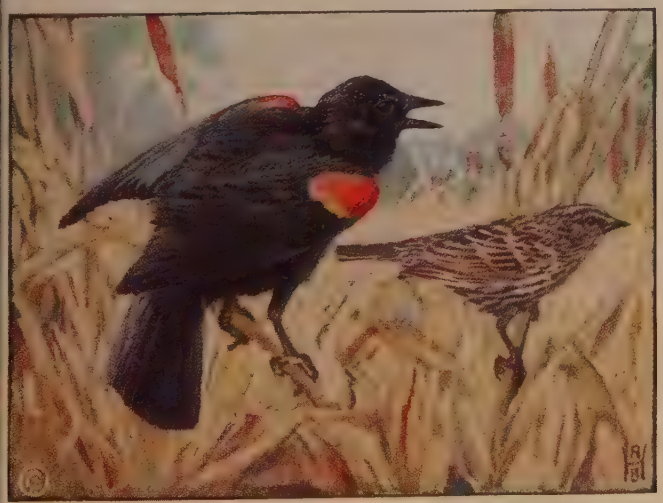


BROWN THRASHER—*Toxostoma rufa*

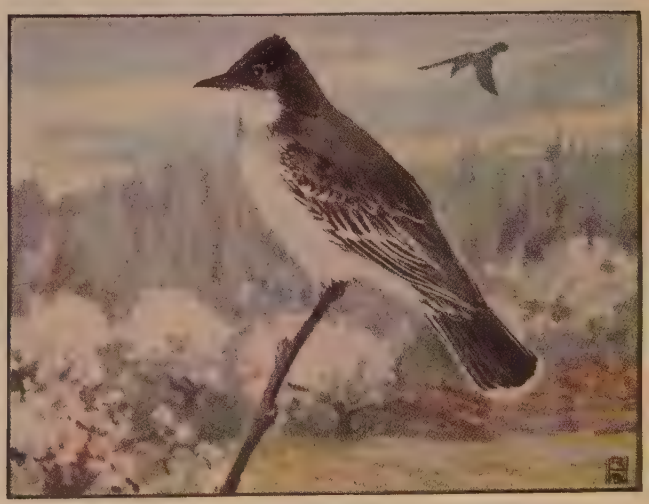
YELLOW-BILLED CUCKOO—*Coccyzus americanus*

CATBIRD—*Dumetella carolinensis*

CARDINAL—*Cardinalis cardinalis*



RED-WINGED BLACKBIRD—*Agelaius phoeniceus*



KINGBIRD—*Tyrannus tyrannus*

the least of which are ants on the wing at breeding time, thus lessening the possible progeny. No nest is built by these birds. The pebbled roof of some tall building, a gravel patch on a hillside are of equal merit in their eyes. Two is the number of the family hatched from densely blotched eggs. When resting, these birds squat lengthwise of a tree branch or the rail of a fence. They are late birds to come north in Spring and leave early in Autumn.

In the crotch of an orchard tree or set upon the intertwining thorny stems over a rose arbor one may find the platform of twigs or sticks which serves as a nest for the mourning dove. Here the two white eggs rest precariously. Ordinarily two or three broods are raised during a long season. While the young are in the nest the parent bird feeds them by regurgitation, mixing the seeds with a fluid in her crop. Since the food is composed almost entirely of tiny seeds, this bird is useful to society and should be protected.

When strawberries are ripe on the hillside, a joyous song, seemingly a glorified combination of robin and tanager, announces that rose-breasted grosbeak is here. The frail nest, built on slender branch or crotch, contains three to five brown-blotched pale-blue eggs. Both share family duties and one may be surprised to see two birds so differently marked and colored brooding on the same nest. The female looks much like an overgrown purple finch. They are a useful pair for they feed their young on larvæ of potato-beetles, cucumber-beetles, and other injurious sorts, also cutworms, tent caterpillars and chinch bugs. For vegetable variety they take the green fruits of viburnum, elm, wild cherry and dogwood. They enjoy woodlands with plenty of undergrowth, not too far from stream or swamp land.

IN THE SECLUSION OF THE DEEP WOODS

*The brown thrasher likes his privacy*

LORENE SQUIRE

Perched on an outstanding dead limb near his nest site, prepared for passing insects, is Sir Kingbird, one of the most common of our large flycatchers. His range extends from central Canada through all parts of the United States except the southwest. The male bird's pet aversion is the crow which he will chase from the premises, even inflicting severe punishment with his strong bill. The nest is frequently placed in an orchard tree toward the end of a branch. It is made of twigs, grass and rootlets, lined with finer material, while bits of wool, newspaper and often the skin of a snake appear as decorations. There are three to five umber-spotted white eggs. Like most flycatchers the kingbird must spend the winter in warm countries, in this case southern Mexico and south to Bolivia.

A slender dove-like form glides silently through the leafy branches. Soon a faint "*cow-cow-cow-cow*" is heard as the bird slips unobtrusively to the platform of loosely placed sticks which serves for the pale greenish-blue eggs. The ventriloquil quality of voice is deceiving, but he may be discovered feasting upon tent caterpillars, for he destroys untold numbers of them during the season. Cuckoos range widely over the United States and southern Canada, and are of great value to orchards and groves, and do their bit against the grasshopper pest. South America as far as Ecuador, Bolivia and Argentina is their winter home.

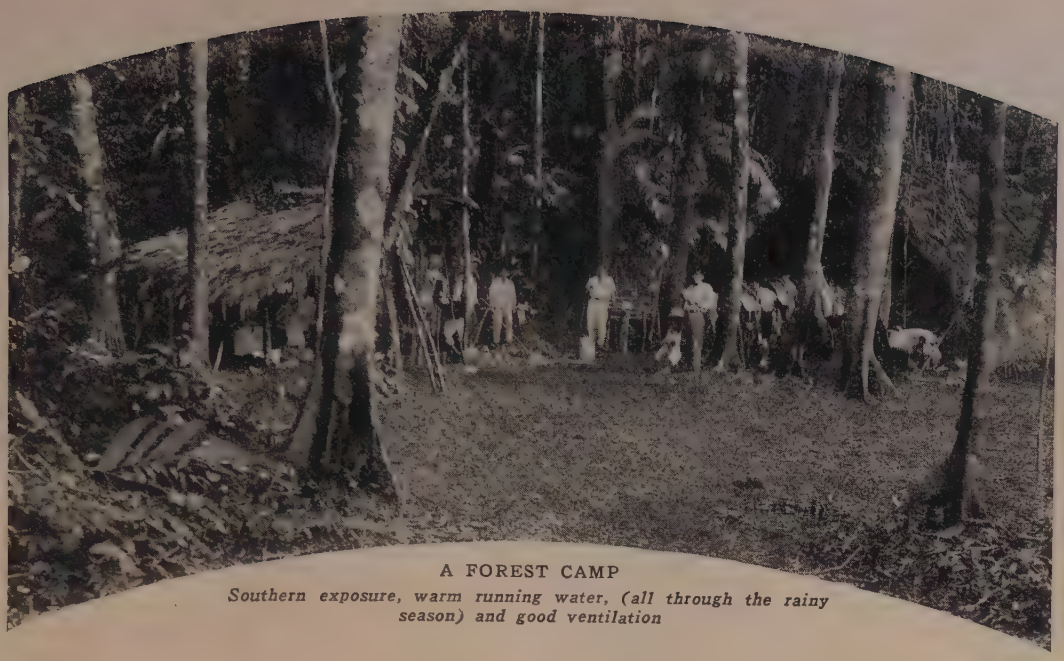
Wood thrush, a native of woodlands, has become accustomed to shaded city parks, or shrub-bordered lawns. His song has served as theme for many a gem of literature, and still he delivers it with undiminished charm and sweetness. At early dawn he welcomes a new day and invites you to join him in the grove. There, usually above one's reach in the crotch of a sapling may be found a nest woven of rootlets, weed stems and twigs cemented to the softer lining with mud. The three to five eggs will be light greenish-blue. Wood thrush finds cutworms, beetles, caterpillars and ants among dead leaves on the ground. When wild fruits are ripe he adds these to his fare. He nests in eastern North America west to the prairie region and winters in Mexico and Central America.

Three members of the strictly American family Mimidae are known over most of the United States. Mockingbirds are found east and west across the southern part of our country. The catbird includes the northwest states and southern Canada with the territory east of the base of the Rockies which it shares with brown thrasher.

Throughout the year the mockingbird sings as he eats the rice weevil, chinch bug and cottonworm, or wild fruit. He polices his territory, sounds alarm to all birds in the neighborhood, and is unfearing in defense of his home. He selects a thicket near the habitation of man and builds a coarse nest for the four to six greenish-blue eggs which are freckled at the larger end.

The catbird builds its characteristic nest in a shrubby place where it is well hidden. The deep bluish-green eggs number three to five. The female is an anxious mother and her mate cooperates in the care of the young, the while singing a low, sweet song. This is such a quiet song that few persons connect it with the catbird for the catcall is much more commonly heard. The food consists of insects and fruit. Mulberry trees planted near will save much cultivated fruit.

Hedgerows, meadows, marshes, are all chosen haunts of brown thrasher who places his nest near the ground or even upon it in a dry upland thicket. He is a valiant defender of his right to seclusion and wise birds keep at a safe distance when he is angry. But his evening and morning song he shares with all, from the highest branch to be found in his vicinity. There are no black marks against him in the matter of his food habits for he hunts in the undergrowth and on the ground beneath. Probably the constant thrashing, jerky motion of his tail as he forages for bugs may be responsible for his name.



A FOREST CAMP

*Southern exposure, warm running water, (all through the rainy season) and good ventilation*

# The ENIGMA of the TROPICS

## Charles Lathrop Pack Forestry Trust Plans the First Tropical Timber Survey

Tom Gill

VOYAGERS for many hundred years have put out on perilous unknown seas in search of rare and beautiful woods. Ebony, teak, satinwood, Spanish cedar, mahogany—their names came down to us bright with all the color and romance of earth's adventurous yesterdays. They evoke a vanished world of stately ships and high-hearted voyaging; lands peopled by strange tribes and jungles made perilous by unknown wild things. Yet in those days the search had always been after a few highly-prized woods, for nations combed the forests of the tropics much as some fastidious woman sorts over a treasure box choosing here and there for her adornment only the rarer, more beautiful jewels. As for the ordinary practical woods; the woods for building and construction; woods that make up the backbone of industry, these were plentiful enough at home. No need to search for pine or spruce or fir in lands across the sea. They grew all around. They were "inexhaustible"!

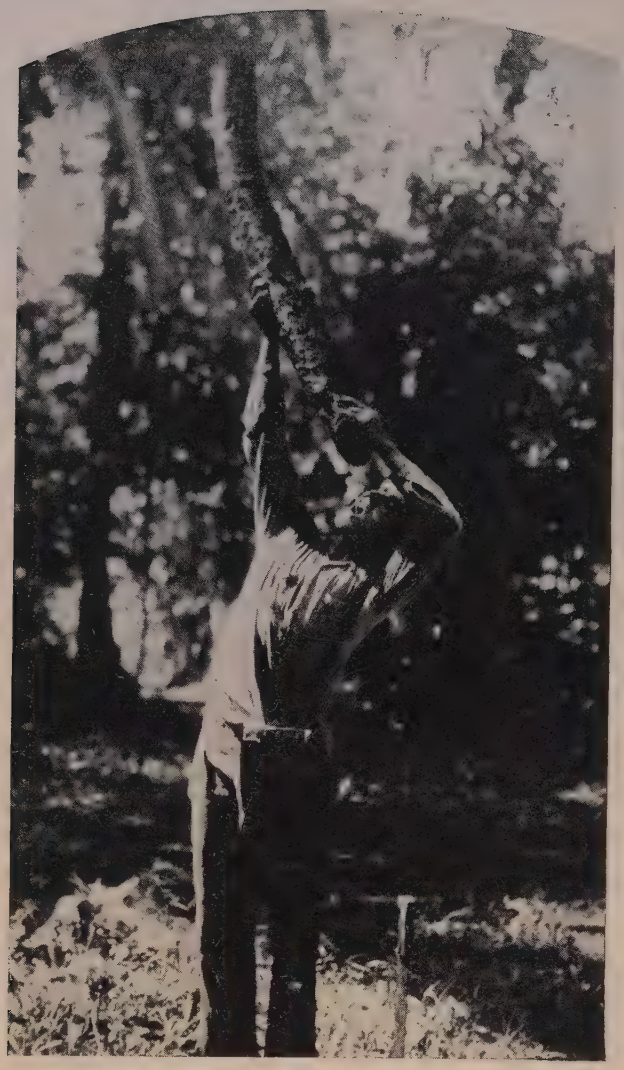
*OUT of the Tropical Forest Expedition described in this article will come a wealth of material for* NATURE MAGAZINE. *Mr. Gill, well known both as forester and author, will write exclusive articles on the trip for our readers. The Expedition will be thoroughly equipped with photographic material, and in a position to bring back outstanding pictorial evidence of the fascinating wild life of the tropics.*

But times change and the world has learned at some cost that "inexhaustible" is a dangerous word. It has a way of playing droll tricks on those who use it. For as the years passed, first here, then there, the pinch of wood scarcity began making itself felt throughout many countries of the temperate zone.

Here in America we watched the countries of the Old World importing woods in greater and greater quantities from Russia, Finland, and Sweden. Secure, apparently, in our own forest wealth, we felt little more than an academic interest in the whole matter. Here in the United States at least was wood to spare. Already by the early part of the last century giant rafts of white pine were floating down the rivers out of New York and Pennsylvania. Woodsmen there told of mile after mile of forests endlessly stretching away to the north and west. No stop to that supply surely! Then a decade or two passed by and the rivers were carrying fewer logs than before. Timber was harder to get out—the logs were not quite so good or straight. Timber was getting scarce back there.

Well, what of that? We had always the Lake States and the pine-covered South. And after those a world of trackless forests west of the Great Plains. What if one little section had been cut out?

So we thought no more of these exhausted forests than one thinks of an abandoned mine. And soon axe and saw invaded the pineries of the Lake States and boom times came over all that land. There was wood for all and timber for all time. Timber for ourselves and for Europe, too, if they wanted it. But strangely enough here, too, after a few decades the mills one by one ceased from cutting, the wheels stopped, and the cutters back in the logging camps picked up axe and canthook and disappeared down the road. The cities, where a brief prosperity had smiled, dwindled and became ghost cities of yesterday. Another great timber region had played out.



But already carloads of yellow pine were coming up from the Gulf States to take the place of the vanished white pine of the North. Mississippi, Alabama, Georgia —the South was full of pine forests, pine to spare. Pine for turpentine, resin, and lumber, billions on billions of feet. Hundreds of years supply. Why worry? And again we turned our minds and energies to more important things.

Meanwhile sawmills sprang up of a size and sawing capacity that the world had never seen. Logging railroads like spider webs made their way back into the heart of those southern pineries. Carloads of logs came down daily to the mills, and the song of the saw was raised wherever pine trees grew. Carload after carload of straight-grained lumber went north and west. Ships heavy with cargoes of yellow pine followed one another to Europe and Asia. And again as before, all went merrily on until—the impossible happened! Yellow pine was getting scarce. Before high-powered machinery and keen demand the forests were actually melting like snow in a summer sun.

Today the end is in sight. Already some of the southern mills are shutting down or trekking west to attack the last great stand of timber in our country. Others, rather than follow the forest across a continent, are bringing logs in from the Pacific Coast and sawing them into lumber hundreds of miles from where they grew.

*(Left)* NO, NOT A SAXAPHONE PLAYER
*The water lianas are a blessing to many a thirsty traveler in the Tropics*

*(Below)* A STREAM IN THE JUNGLE
*Often the density of tropical vegetation is so great the explorer carves his path, inch by inch, or follows streams*

So today we in America are entering our last great timber storehouse. How long it will last depends on many things. It depends on how much timber we can grow with the help of our foresters. And it depends on how much we can get from other lands.

Wood scarcity has come to be a world problem, a problem with which the peoples of the North Temperate Zone are vitally concerned. It is a question not only of the exhaustion of our pines, spruces, and firs—that great class of woods we call the softwoods—but to even a more serious degree the problem concerns itself with our dwindling supply of hardwoods—the oaks, ashes, hickories,—the woods we use for furniture, flooring, implements, tools, those special purpose woods for which the world knows no satisfactory substitutes. These species in qualities that we have come to demand are getting scarce indeed, yet our very civilization is built upon them.

So once more the northern nations may go voyaging to the tropics, not after the precious luxury woods this time, but driven by grim necessity now in search for plain, honest woods to replace those that have gone.

And it is natural that the eyes of the wood-using peoples should be turned toward the south, since from the very first tales have been brought back of the dark, dense forests of southern Mexico and of Central and South America. Lands whose trees rivaled the giants of our own Pacific Coast. And it was reasonable to believe that

MILKING THE COW TREE *(Right)*
*Called palo de leche, this tree yields an abundant and palatable milk*

THE JUNGLE RECLAIMS ITS OWN *(Below)*
*Less than fifteen years ago this was a field cleared for crops, but the jungle closed in*

YOUNG TEAK TREE
*This valuable species has been successful in Latin-America*

in those countries where growth is continuous for three hundred and sixty-five days in the year, where moisture is abundant and soil amazingly fertile, that there, if anywhere, should be a very Paradise for trees.

But other travelers returning told tales that varied rather astonishingly. Some said that we could never depend on the woods of these equatorial lands, that there was not enough timber accessible, that it was all too heavy and hard, that it would not season without tying itself into knots. Others said it could never be profitably transported over such great distances. Many believed that as substitutes for our own woods, the tropics had nothing of value. Still travelers continued to come back with glowing accounts of trackless forests of magnificent trees ripe and ready, and of woods much resembling our own hardwoods. Others told of the amazing variety of species there. Hundreds of different kinds, different in texture, color and weight. Some lighter than cork, some so heavy they sank in water like stones. But nobody knew how much there was of these different woods or just what they were good for.

And in the face of this doubt and these conflicting, perplexing tales, industry shook its head and capital thought it safer to remain at home. For industry and capital dislike taking chances. They want facts.

Already a few foresters had interested themselves in these tropical timber lands. Foresters knew that so far as both hardwoods and softwoods were concerned the United States was due for a period of lean years. It was part of their job not to overlook any possible source of wood against that coming need.

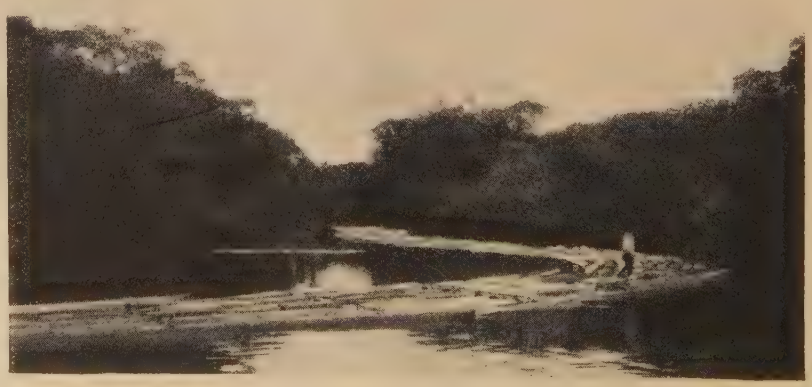
Curran had made extensive trips through South America and reported on various tracts of timber. Whitford had studied and explored there. Record for twelve years had worked on the structure and physical characteristics of these tropical woods, building up a body of scientific facts for use in the identification of the numberless tree species.

In the Philippines Major George P. Ahern, Director of the Insular Forest Service, had demonstrated that the woods of the tropics can be made both to serve domestic needs and to be sold in foreign markets. A few years before millions of feet of Oregon pine had been shipped to the Philippines. Today practically no wood is imported but instead millions of feet are shipped to other nations. These things were made possible only because Philippine foresters had studied both the woods and the forests. They knew what the forests contained, what the different species were, what they were good for.

MAHOGANY-KING WOOD
*The world has sought the tropic for years for this prized tree*

And all this naturally aroused interest in the possibility of importing tropical woods to the northern nations, but action still lagged. Industry was still unwilling to go in until she knew more about it all. Foresters were realizing that until we could get a definite body of knowledge concerning the amount of tropical timber and its condition, the present attitude of scepticism, doubt, and inertia would continue. More than one unsuccessful attempt had been made toward persuading Congress to appropriate money for explorations into these equatorial timber lands. Colonel Greeley, chief of the Forest Service, had said that the first step should be to provide for a study of the distribution, quantity, and accessibility of these tropical woods. All were agreed on the necessity—but nothing happened. Meanwhile our timber supply kept diminishing.

Now fortunately for human progress, contributions to man's knowledge have not entirely depended on the hesitating steps of industry or the deferred appropriations of governments. A few individuals and or-



S. J. RECORD

RAFTING OUT THE LOGS
*Waterways play the dual role of boulevards and railroads over much of the Tropics*

ganizations viewing world problems from world viewpoints have played the part of pioneer in widening our horizons of knowledge.

In this role of pioneer the Charles Lathrop Pack Forestry Trust has just added to its projects a three-year program of tropical forest research. Dedicated to the advancement of forestry in the United States, the Trust is financing the first expedition ever to embark with the purpose of making a general survey of the forest resources of the tropics. The field work itself will be under the direct supervision of the Tropical Plant Research Foundation, an organization which has already carried out forestry studies in Cuba and Central America. The Trust has recognized that the timber producing capacities of the tropics is both a domestic problem and a world problem, since no adequate forest policy can be formulated either for the United States or for the world without some knowledge of the part these equatorial resources are destined to play. Indeed any plans for future forestry measures on a national scale are bound to be modified by a knowledge of what these timberlands do or do not contain.

"Speculation and surmise are insecure guides," Mr. Pack has said. "In so vital a matter as our future timber welfare we should be content with no less than definite disinterested knowledge. So our expedition will be essentially a fact-finding expedition with no other purpose than to learn and bring out the facts as they are found to exist. We are not trying to prove anything. We may find much or little, but our purpose is to be purely fact-finding. Our aim is to remove the wall of ignorance that has so long stood between industry and the timber storehouses that we know exist to the south."

It is a big undertaking and contemplates at first a general survey of the important timber countries. The first expedition will leave Washington in November for Central America and the nothern coast of South America. Eventually the expedition will visit all countries whose forests are of commercial significance. How much wood is there, what kind is there, what use is being made of it, how easily can it be got out? These questions and others will be part of the study for each country. Unexplored lands, unmapped regions will be visited. The work will be done by boat, canoe, muleback, airplane, or afoot—whatever mode of conveyance is best adapted to the work. Other expeditions to these countries have reported on the wealth of animal and plant life encountered. Many of these will be studied and photographed for no region in the world supports such interesting and colorful wild life. Special photographic equipment will ensure pictures of the forests and of the forest dwellers. Specimens of unknown tree species will be sent to scientists in this country for botanicial identification. The Yale Forest School has offered its cooperation in identification of wood specimens.

Before the explorers return they will probably meet with some hardships and not a few adventures. They will learn the ways of strange people and live for a time in strange places and it is quite likely they will find tree species today unknown by man. They will reach corners where white men have never been.

But their purpose and hope is to make a definite contribution to the world's knowledge. To bring back information that will help put on a more satisfactory basis the relation between the forests of the tropics and the great timber problems that confront the world of today.

# A Nature Puzzle

*By* Florence H. Moore

I AM CONSIDERED a very handsome bird and noted for my gracefulness and endurance in swimming. Have about decided to try and swim the English Channel and win a few medals and championships myself. You will find me in the picture, also the letters of my name.

In Zoology, I belong to the order Cygnus, or the——there, I almost let it slip that time. There is also a beautiful configuration of stars known as Cygnus too. You may also know it by its other name, the Northern Cross.

*Answer to July Puzzle*

MEXICAN EAGLE

NATIONAL PARK SERVICE

PARKS THE MECCAS OF THE AUTOMOBILE TOURISTS

*Scene of the public camping ground in Mount Rainier National Park, visited annually by thousands*

# *A Glance Backward at* NATIONAL PARK DEVELOPMENT

by Stephen T. Mather

*Director, National Park Service*

As the tenth anniversary of the organization of the National Park Service passes into history it is interesting to pause and look back at the achievements of the last decade. Experiments, new developments, a few temporary discouragements, all go to make up the last ten years of national park history. But through it all is progress, and the increasing use of the parks by the people of the United States.

It was in August, 1916, that Congress passed the organic act by which the National Park Service was created, but not until the following Spring were funds made available for the actual organization of the new bureau, which was "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

In 1915 there were fourteen national parks, and eighteen national monuments. During the 1915 travel year 334,799 visitors to the parks were recorded.

Since that time several national parks have been created, bringing the total number to nineteen, and Congressional authority has been given to the creation of four additional parks under certain conditions. The total number of national monuments administered by the Interior Department is now thirty-two. To these reservations, during the 1926 travel year, came a total of 2,314,905 visitors, a gain of five hundred per cent over the re-

NATIONAL PARK SERVICE

NATURE HIKES ARE POPULAR IN THE PARKS

*A group of Nature and outdoor lovers on the trail in Mount Rainier National Park*

corded travel in the playground areas eleven years ago.

The matter of supplying accommodations of various types to park visitors is no small problem. Experience and careful study have proved that the most practicable method of handling the public utilities in the national parks is to permit private capital under long-term franchise, to furnish the necessary hotel, lodge, and transportation accommodations.

Although private capital goes into these enterprises, they are conducted under strict Government supervision and rate control. In the case of actual physical construction, our landscape engineers cooperate with the operators in studying plans and selecting locations so that none of the structures will be inharmonious with its surroundings, or out of place in a national park. Here, too, difficulties have been encountered as in several of the older parks structures were erected before the organization of the Service which were not at all in keeping with the ideas of the landscape engineers or the present park administrations. It has taken many years to remove some of these eyesores, but they are being gradually cleaned up.

With the increase of motoring throughout the country, the number of automobilists entering the parks greatly increased, and in an effort to accommodate them roads have been improved and where necessary new roads constructed to the features of outstanding interest. It is not the purpose of the National Park Service to gridiron the parks with highways. Just the reverse is the case; the greater part of the larger parks will always remain wilderness areas, reached only by trail, either on foot or horseback. It is proposed, however, to have such roads as are available brought to the highest standards.

One of the big problems that has faced the National Park Service is the adjustment of park boundaries. At the time some of these reservations were established, back in the Nineteenth century, definite surveys of the areas had not been made, and boundaries were arbitrarily set, without regard to natural topographic features, such as rivers and mountain ranges. Lack of natural boundary lines often complicated administration of the park, and recently several boundary revisions have been made by Congress to rectify this condition. In other cases scenic areas of major importance, such as the Teton Mountains south of the Yellowstone, were left out of the park at the time of creation through lack of complete information regarding them and bills to incorporate such lands have been introduced in Congress. No park boundary, of course, can be changed except by act of Congress.

It happens that in many cases lands desirable for inclusion fall within adjacent national forests. In order that there might be no conflict between the interests of the two classes of reservations, two years ago the President's Committee on Outdoor Recreation appointed a committee to study the question of adjusting park boundaries when national forest lands were involved. Study was made on the ground by this committee of several proposed boundary changes, and acting upon its recommendations the Sixty-ninth Congress passed laws changing the boundaries of four national parks. These were the Grand Canyon, Mount Rainier, Sequoia, and Rocky Mountain.

The committee also recommended the enlargement of Yellowstone National Park to include the Teton Mountains and the headwaters of the Upper Yellowstone River. This project, however, failed of success because of the efforts of Idaho irrigation interests to secure, in the bill making the addition, the elimination of the Bechler

NATIONAL PARK SERVICE

**MERE MAN AND THE MIGHTY MOUNTAIN**
*Long's Peak in the Rocky Mountain National Park as viewed from Chasm Lake*

River section of the park. This is a scenic portion of the Yellowstone and meets the requirements of national-park status. Its elimination from the park is strongly opposed by the National Park Service.

Misapprehension seems to exist in the minds of some people regarding the withdrawal of lands from definite economic use and their preservation as national parks. The total area of the national parks is only 11,804 square miles, while the total area of the United States is 2,056,676 square miles. Slightly more than one-half of one per cent of our country, containing its most magnificent scenery, is not too much to set aside for perpetual preservation, to serve as bird and animal sanctuaries and to preserve for all time bits of the native wilderness as it existed at the time our forefathers came to America.

There seems to exist in some minds an idea that in order to preserve the beauty of the national parks, economic developments, which supply the necessities of life,

are thwarted. Such is not the case. It is true that irrigation or power interests would reap private benefit were they permitted to develop park waters, and that local communities might temporarily benefit by such development. The country at large, however, would suffer irreparable loss were its scenic riches given over to commercial use. The same economic developments can be secured by using waters outside the parks even though it could not be used so cheaply. It is being gradually realized that the national parks play an important part in protecting the watersheds of streams important for economic use, including many commercial developments and the protection of farm lands from drought. Many localities so recognize the value of national parks that they are urging the inclusion in the system of areas that do not measure up to national park standards.

Another land problem which has caused some difficulty in administering the national parks to the best advantage has been the existence of private lands within their exterior boundaries. With the exception of the Yellowstone National Park and Hot Springs, which were created before any of the lands desired for original inclusion had been settled, practically all of the national parks contain private lands. Whenever bona fide private holdings exist within the park area at the time of the park's creation, they are always protected, as private lands within these reservations are as much the property of their owners as is land elsewhere. The Government can not, and does not wish to take it from them or regulate its use so long as such use is not contrary to national or State laws.

During the twelve years that I have been connected with the administration of the national park system, continued efforts have been made to obtain private holdings within park boundaries for donation to the United States. Private contributions amounting to $150,000 have been secured to purchase the magnificent stands of *Sequoia gigantea* and other private holdings in Sequoia National Park. These were turned over to the United States to be added to the park. The only appropriation made by Congress to purchase lands for park purposes until this past year was in 1916, when an appropriation of $50,000 was supplemented by $20,000 subscribed through the National Geographic Society to purchase an important stand of trees in the Giant Forest of Sequoia Park. This year, however, Congress recognized the importance of consolidating park lands by the elimination of private holdings, and appropriated $50,000 for the purchase of privately owned lands within the boundaries of any national park, to be expended only when matched by equal amounts by donation from other sources for the same purposes. This I consider one of the most constructive pieces of national park legislation that has been passed in recent years.

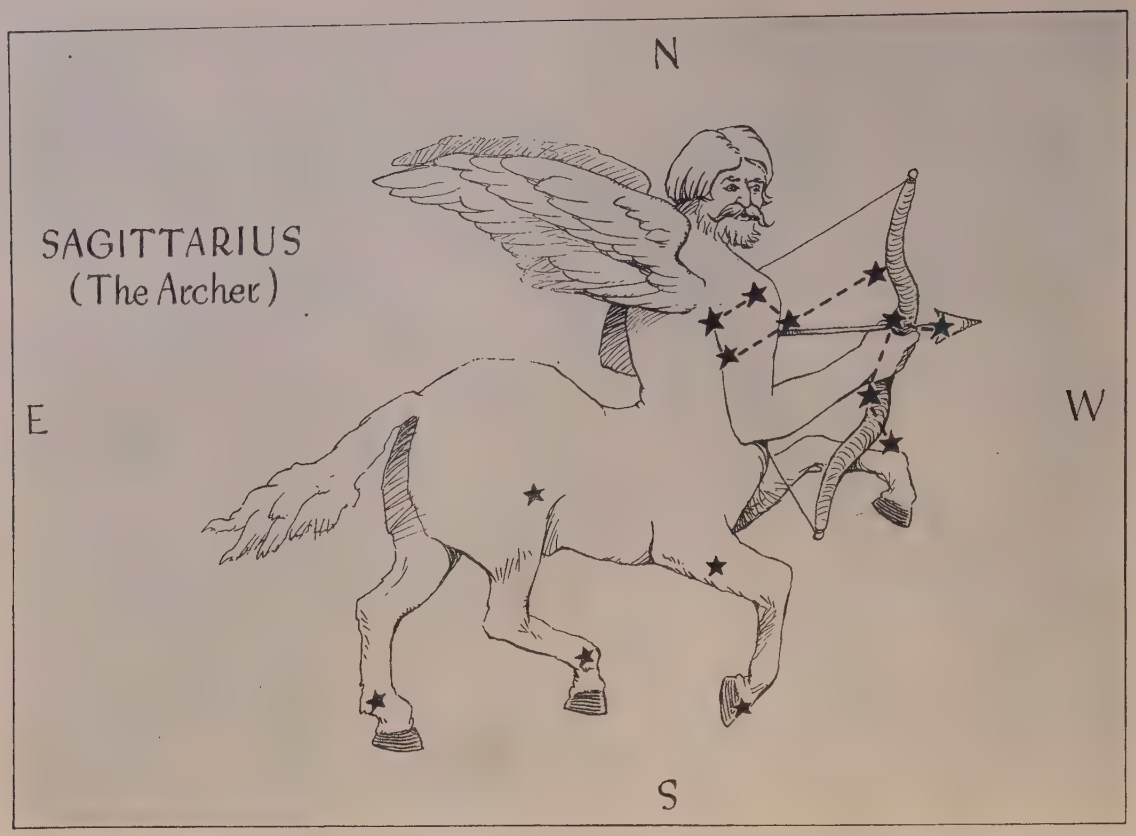
NATIONAL PARK SERVICE

PARK PLAYGROUND OF THE NORTHWEST

*Paradise Inn in Rainier National Park with the majestic peak in the background*

In some cases where private holdings along main roads or in places of strategic interest in the parks contained valuable lumber which the owner planned to cut, it has been possible to secure this land by exchanging for it timber in other portions of the park where the scars from cutting would not be so conspicuous. Congress by law has authorized such exchanges, and the parks have benefited by them. It is regrettable, of course, that any one should have the right to cut timber in any national park, but when this timber is private property there is no way of preventing its owners cutting it except by securing it through exchange or by purchase through donation or the appropriation of Federal funds. It would be a worthy act, and a patriotic one, if those people who are sincerely worried over the cutting of timber on private lands in the parks would devote their efforts to raising the necessary funds to purchase the lands and donate them for park purposes.

It is unfortunate that our country has not yet fully awakened to the economic importance of our national parks. Their value lies, not in exploiting the lakes and rivers for the sudden enrichment of a few individuals or corporations, or even a neighboring locality which constitutes but small portion of the national domain. It consists not in cutting a few forests, so as to get an immediate supply of lumber which would be ridiculously small when compared with the output from the national forests and from private lands. Rather, the economic value of the national parks lies in offering to American travelers objects of such general scenic interest as to lead them to see and explore their own country first, thus keeping at home millions of dollars which would otherwise be spent abroad, and which spent in the United States in travel brings increased taxes into the Federal Treasury, as well as increased prosperity to the various industries serving the public in and en route to the park, and to the neighboring communities. Foreign countries long ago capitalized their national scenery. The United States can do the same, by protecting parks from commercialization and providing facilities.




OUR CONSTELLATION FOR AUGUST

*It represents the fabled Centaurs and Sagittarius was the ancients' patron of the hunt*

# SAGITTARIUS

## *and the August Heavens*

by Isabel M. Lewis

Low in the southeastern heavens this month and directly east of Scorpio lies the zodiacal constellation of Sagittarius, The Archer, easily recognized by the little "milk dipper" with bowl turned toward the southern horizon.

Sagittarius contains no star of the first magnitude, but one of the second and seven of the third magnitude are in the group that form the little dipper and the right-angle triangle to the southwest of it. These stars form but a small part, however, of the large constellation that is supposed to represent one of the Centaurs or Bull-killers, half horse and half man, that were said to inhabit Mt. Pelion in Thessaly.

The fable that such creatures existed on this mountain probably can be traced to the fact that the Thessalians were famous horsemen and that it was one of their national pursuits to hunt the bull on horseback. Sagittarius, then, was considered to be the patron of the hunter.

The star Lambda, at the end of the handle of the little dipper, lies directly in the path of the Milky Way, which is very brilliant and beautiful and very complicated in structure in Sagittarius. Here there are gaseous nebulae and star clusters and dark holes or "pockets" and long dark lanes or streaks now known to be dark nebulae, seen against a brilliant background of many faint, distant stars that form the so-called star clouds of the Milky Way.

In Sagittarius we find the odd and interesting Trifid Nebula, a mass of glowing gases of enormous extent, cleft by dark lanes of non-luminous gases, and also two clusters of stars that are faintly visible to the naked eye. One is a few degrees north and a little east of the star Lambda, and the other nearly due west of it at a distance about equal in extent to the handle of the little dipper. Directly north of this cluster and quite close to it lies the Trifid Nebula. This also marks very closely the position of the sun when it is farthest south in December.

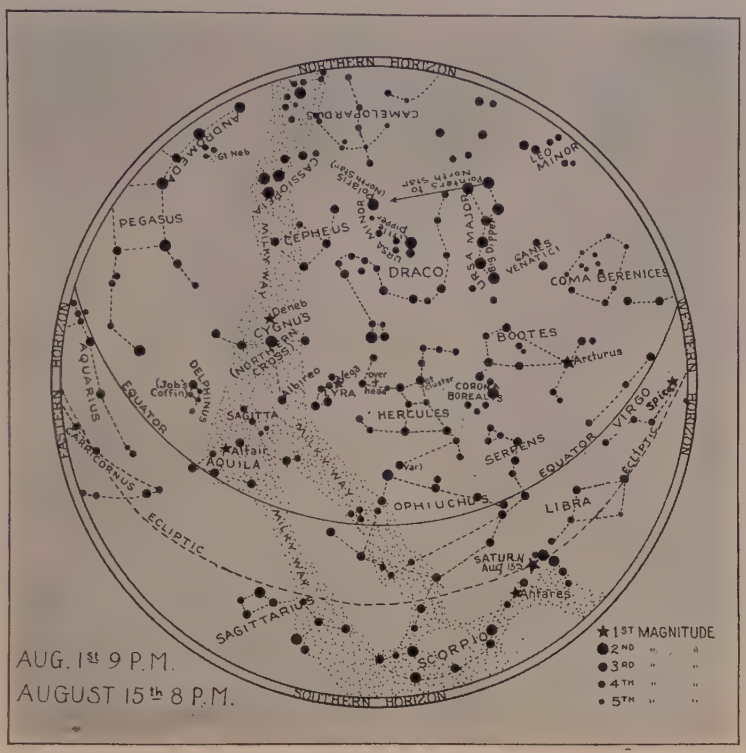
Viewed through a powerful telescope this is one of the finest regions in the heavens and some remarkable photographs of the Trifid Nebula and of the vast star clouds of the Milky Way in Sagittarius have been taken with the great 100-inch reflector of the Mt. Wilson Observa-

vatory on Mt. Wilson near Pasadena, California.

Sagittarius and Scorpio are the two most conspicuous constellations in the south this month. The fiery red, first magnitude star Antares in the heart of the Scorpion glows conspicuously in the southwest not far from the planet Saturn which is now in Scorpio and which is yellowish in color and brighter than Antares.

Vega in Lyra is now nearly in the zenith, and about half way from horizon to zenith in the western sky is Arcturus in Boötes with its characteristic orange tinge. It is one of the finest stars that is to be seen in our summer evening skies.

Directly east of Vega and high in the eastern sky is the Northern Cross in Cygnus lying in the path of the Milky Way, which is remarkably brilliant and beautiful in the August evening skies. Altair, in Aquila, a white star of first magnitude, also lies in the Milky Way to the southeast of Vega.




THE EVENING SKIES FOR AUGUST

*To use hold over the head with the top toward the North*

In the northeast the royal pair, Cepheus and Cassiopeia, are now swinging upward toward the meridian as the Big Dipper in Ursa Major swings slowly downward toward the northwestern horizon.

An interesting question has been asked by one of our readers as to the identity of the sickle-shaped group of fairly bright stars which lies between the bowl of the Big Dipper and the constellation of Lynx to the west and which, it is stated, does not appear to be named on any star maps. This curved line of stars is conspicuous and clearly defined and belongs to the constellation of Ursa Major, outlining the head and forelegs of the bear. The constellation of Ursa Major is a huge one and the seven stars of the Big Dipper which outline the tail and back of the bear form only a part of this constellation. In addition to the seven brilliant stars in the Big Dipper there are more than thirty stars in Ursa Major that are clearly visible to the naked eye. The majority of them are of the fourth and fifth magnitude and nearly all of the thirty-odd lie below the bowl of the Big Dipper or in front of it to the west and form the legs and head of what the ancients saw as a bear.

Occasionally one hears such groups as the Big Dipper in Ursa Major, or the Pleiades or Hyades in Taurus referred to as constellations, but this is incorrect. Every conspicuous group of stars is not necessarily a constellation and the groups mentioned are simply noted groups or clusters *within* constellations. Although in a few cases there is some disagreement among uranographers as to the exact boundaries between certain constellations, on the whole the limits between the various constellations are very sharply drawn on the large star atlases and celestial globes.

Among the planets this month Venus, Mars, Jupiter and Saturn are in the evening sky while Mercury appears for nearly a week before and after the date of its greatest western elongation, August 8, when it is at its greatest distance west of the sun. On that date it will be about fifteen degrees north of east and about an equal distance above the horizon at sunrise.

Venus is now drawing in rapidly toward the sun and is at its greatest brilliancy on August 5, at which time, viewed through the telescope, it will show the same phase as the crescent moon when it is four days old. This is the last month that Venus will be seen in the evening sky for some time to come for it will be in conjunction with the sun next month and after that will be Morning Star.

Mars is now in Leo and too near the sun and too faint to be seen to advantage. On August 26 it will be in conjunction with Venus and nearly nine degrees north of it. Jupiter is now in Pisces and is a brilliant evening star visible in the east later in the evening. Saturn is in Scorpio this month a little to the northwest of Antares and in fine position for observation.

This is the month when meteors belonging to the annual swarm of the Perseids appear in considerable numbers. They come from the general direction of the constellation of Perseus which rises later in the evening in the northeast and they should be seen in greatest numbers around midnight and from August 11 to 16.

AMONG *the features of the September issue of Nature Magazine will be another story by Dallas Lore Sharp; a fascinating fish article by Ben Hur Lampman; wild flower pictures in color, and a helpful article on the iris and how to grow it.*

# HINTS AND HELPS
## FOR
# HOME and GARDEN

## AUGUST

Now that the days are hot and muggy, be sure that your household pets have a drinking place which is renewed with fresh water every day.

* * *

Daily watering of plants is as bad for them as daily neglect during a drought. Soak them well and cultivate them, then leave them alone for a few days.

Adjust the lawn-mower for the hot weather. If it cuts too short, the rays of the sun will burn the roots of the grass. Too frequent cutting is not advisable at this time of year for the same reason.

* * *

Transplant perennial seedlings to a permanent place, in order to give them a chance to become established before cold weather. Excellent results are obtained by pouring water in the hole before placing the plant in it.

Pinch the top buds of chrysanthemums, geraniums, and carnations so that you will have strong, bushy plants for winter flowering. Cut back the old geranium plants severely. Cuttings for new plants may be taken this month by snapping off the tips of strong shoots and placing them in moist sand to root. After they have rooted thoroughly, transplant them to 4-inch pots and moderately rich earth.

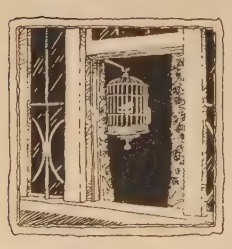
* * *

Windows are often left open near the canary. Be sure that he is never left in a draught, as any sudden change of temperature may prove to be fatal.

There is nothing better to mix with sandy soil than peat moss. To lighten a heavy clay soil, it is also beneficial.

* * *

When phlox has finished blooming, cut them off to the ground, and it will flower again in the late fall. If your phlox is troubled with mildew, shake powdered sulphur on them. A baking powder can with holes punched in the top will prove an excellent shaker.



Stake up the cosmos before it is bent down by a heavy rain.

It is well to put wood ashes on the asters, but be careful not to injure the shallow roots in digging.

It is time to pot the Jerusalem cherries for winter flowering. They require good soil, plenty of sunshine, and moist but well-drained earth.

The fall flowering plants like dahlias and chrysanthemums must be well fertilized from now on to give the best results. Liquid manure applied every two weeks is excellent.

* * *

In planting new iris, avoid the mistake of burying the roots. It is usually considered best to leave the top of the bulb exposed. If you haven't ordered bulbs for spring flowering, it is high time to do so.

Take off ten inches of soil from the asparagus plants and sow bone meal and nitrate of soda on the crowns. Then cover with soil again and dig in some cow manure on top.

Cut out the old wood from raspberry and blackberry plants when the crop has been gathered. Sow lettuce and spinach for fall use.

* * *

The sunlight is more direct in the summer, so when you are taking snapshots in the bright sun at the seashore or in the mountains you will probably do better if you close the diaphragm one degree more than usual to avoid over-exposure.

In repotting plants, it is advisable to use clean pots which have been soaked in water for 24 hours. This will prevent the pot from drawing moisture from the earth. Fill the bottom with pebbles or pieces of broken pots to provide good drainage. Then fill the remainder with earth. A mixture of rich loam, humus, and a little sand is very good.

* * *

Less trouble with weeds is the result of preventing them from going to seed and so producing hundreds more of their own kind. Weeds continue to grow even when garden flowers are discouraged in the hot weather.

* * *

Have you looked at the lens of your camera lately? It gets dirty very quickly in the summer and is the cause of hazy pictures.

In August you may still sow the seeds of plants like hollyhocks, sweet-williams, forget-me-nots, and wall flowers. These plants grow more quickly than others and can still store away enough energy to carry them over the winter.

WHERE THE TRAIL ENTERS THE WOODS

# *Making a Memory Trail*

## A Way to Keep Green the Memory of Interesting People and Places

by Fred E. Brooks

*Photographs by the Author*

SEVERAL YEARS ago a friend who is interested in wild flowers gave me a plant of the large-flowering white trillium, or wake-robin, of our eastern woods. I set the plant in moist, rich earth by the side of a little path in the woods. It lived and bloomed and bore seeds. Nature scattered the seeds all around the parent stalk and I now have a colony of more than twenty blossoming trilliums by which to remember my friend.

Again, I was tramping along a secluded, wooded shore of Lake Superior, in northern Michigan. It was June and everywhere in open spaces among the trees blue irises were blossoming. I knelt down to dig up a few plants of the iris to take back to West Virginia, and, hearing a slight sound in a nearby thicket, looked, and a wild deer was watching me with wondering eyes. The iris plants were later set in a moist place beside my woodland trail. They flourished and spread, and every June I now have great beds of the handsome blue flowers to remind me of that bygone day in the Michigan woods and the deer which watched me from its cover.

BELLS OF VIRGINIA COWSLIP

*Absent from the woods for fifty years, it now grows profusely once more*

Still again, I spent a Spring afternoon with a naturalist in the woods around the Great Falls of the Potomac, above Washington. We were looking that day for birds and other wild things. At a sunny spot in the woods I pulled a single small plant of the fragrant sweet fern shrub and when I returned to my home, set it beside my trail. The plant has now spread into a thrifty clump and whenever I look at it I am back in the Potomac woods where the prairie warblers were singing in the low pines, and where, on the ground beneath a snowy-flowered Ceanothus bush, I saw my first nest of the worm-eating warbler.

Thus, year after year, I have planted by the trailside dozens of living reminders of good friends and joyous days in the open. Such a trail may be made in almost any unpastured woods or woodlot. Even the shaded

PURPLE-FRINGED ORCHIS
*They flourished among clumps of spinulose shield ferns*

PINK MOCCASIN-FLOWERS
*A beautiful group invited to share the side of the trail*

corner of a lawn will serve. My own trail winds through a brushy field, follows a rocky ravine, ascends a dry beech-and oak-covered hillside, drops down to a clear brook, and, finally, returns leisurely through shade and sunshine to the starting point. Along its course there are spots suited to plants of varying habits and tastes. Cool banks for the shade-loving species, large rocks for the stony-hearted, and marshy places for those that like wet feet. At every turn there are fresh reminders of pleasant people and interesting times and places. Thirty-three different species of native ferns flourish by the way. True, some of them are old residents of the place, but many others have been picked up here and there, either by myself or my friends, and are growing in their present locations by adoption. I have walked many a rugged mile and climbed many a slippery cliff in securing some of them.

There are plants of the rare Kate's Mountain clover, dug up on a mountain-side overlooking White Sulphur Springs, in West Virginia; there is a bed of Venus' Flytrap, from near the North Carolina coast; pitcher-plants and lambkill, from Massachusetts; Jeffersonia and Linnaea, from Pennsylvania. There are some fruitful hazel bushes given me by a friend at Lancaster, Pennsylvania, a group of blight-resisting Chinese chestnuts contributed by a scientist, at Washington; a fine clump of white spruces, which, when the trees were tiny seedlings, the superintendent of a forest-tree nursery at Saratoga Springs, New York, permitted me to slip into my lunch-box one time after I had eaten dinner on his grounds.

There are wood lilies from Storrs, Connecticut; bird's-foot violets, from the mountains near Cumberland, Maryland, and a single white, or albino, moccasin-flower, among numerous pink ones, from an enchanting spot in the Alleghany Mountains.

My clump of gray birch trees is associated with a day in Maine, when I found the dainty nest of a pair of American redstarts ten feet up in a gray birch tree, and the nest of a hermit thrush, with four blue-green eggs, on the ground just beneath it. My lovely bed of yellow lady's-slippers reminds me of the time I rescued the original plants from the edge of a pasture field where a herd of grazing cattle considered everything fodder that came to their tongues.

My galax plants are from the mountains of North Carolina, and a glance at them brings back a day in June when two of us climbed to the summit of Mt. Mitchell. When we arrived at the base of the mountain the galax which covered the ground had passed its blooming period and only withered petals and brown seed-pods were on the flowering stems. I had never seen the pretty spikes of cream-white flowers of the galax and was disappointed that we had arrived too late for them. Then we began to climb the mountain. A thousand feet up the vegetation was noticeably more backward than it was below. Azaleas and rhododendrons that were out of flower around the base of the mountain were at this higher level in full bloom. Then we began to observe here and there a few flowers on the very tips of the galax spikes. For the blossoms of galax, like most other flowers which are borne in spikes or racemes, open first at the base of the spikes and last at the upper end.

Higher up the mountain the flowering tip lengthened, the area of bloom creeping steadily downward as we

FERNS BY THE WAYSIDE
*This natural bed of boulder ferns adorns and graces one side of the trail*

DAINTY BLOSSOMS OF GALAX
*They open first in a ring about the spike and gradually climb the stem*

ascended. Soon there was a belt of open flowers around the center of the spike, with buds above and withered flowers below. Still higher, and the belt of flowers was at the base of the raceme. Then there were no flowers at all, only green buds clothing the newly-unfolded stem. Finally the galax plants ceased altogether, giving place to more northern forms of vegetation which thrived better in the cool, damp atmosphere of the high elevation.

During the hours of that day we saw galax plants in all stages of budding, flowering and seed-bearing by the mere act of climbing the mountain. It requires many days for one to see all these phases by watching the plants along my trail. But the watching is not irksome, especially to one who can look back to his first sight of galax blossoms on the towering slope of Mt. Mitchell, where purple-flowering rhododendrons and blazing yellow azaleas colored the whole near landscape, and where in the misty distance the peaks and ridges of the Great Smoky Mountains faded imperceptibly into the purple clouds lying low against the horizon.

William Beebe, in "Jungle Peace" recalls that a trail once cut through coarse grass and belts of cedar, in time became the Appian Way, and suggests that Fifth Avenue, before it was an Indian trail or a Dutch road, may have had its first hint in a moose track down the heart of the wooded island, leading to some hidden spring. But I do not want my trail ever to become a military road or a city street. Tramping throngs would profane it. Sometimes when a hunter with a gun passes over it I feel that the place has been desecrated.

Of all terrestrial highways into which men turn their feet, the most romantic is a narrow path through the woods; a path darkened by leafy branches, illuminated with wild flowers, enchanted with bird's songs and mysterious odors; a path that climbs hills, lingers by murmuring brooks and peers into doors half ajar where wood fairies dwell. Such a path provokes thoughts of a peculiar kind and calls up old memories. Sometimes when one follows a woodland path as a luxury, I think he may dimly remember impressions made upon his primitive ancestors when they followed such paths from necessity. Inherited memories, racial memories.

I always endeavor to make my transplants fit into their immediate surroundings. Somehow, Nature never fails to carve her leaves and spread her branches and tint her flowers with a nice regard for their environment.

Long before my memory trail was started thoughtless Nature-lovers had so persistently plucked and dug certain kinds of attractive wild plants in the vicinity that extermination of them had followed. Among those that had disappeared were tree club-moss, wild leek, painted trillium, yellow lady's-slipper, golden seal, ginseng and Virginia cowslip. It has been a rare delight to re-establish each one of these plants in its old place, in some cases after an absence of half a century. And so my trail lives perennially, growing more interesting year by year and keeping green pleasant memories.

# NURSERY NATURE TALES

Being the Adventures of Toby and Beth,
Two Very Little People in the Big World.

## *Gold Dust*

by Elizabeth K. Peeples

"WHERE do all the flowers come from?" asked Toby.

"Out of seeds, much as birds come out of eggs," said Mother.

"Where do the seeds come from?" Toby wanted to know.

Mother, Beth, and he had gone to the meadow to gather daisies and buttercups. Beth's buttercups shook as she stepped through the tall grass, and a shower of golden dust fell on her hand.

"My buttercups are spilling yellow pepper," she said.

"That is pollen, dear, and it is part of the answer to Toby's question. Down in the heart of the flowers there are little seed boxes. The seeds are very tiny at first, and would not grow even if they were planted; but flowers have pollen boxes too. When golden grains of pollen fall on the seed boxes, the seeds come to life. They grow large; and when they are put into the soft warm earth, a little plant comes out of each seed."

"It's a magic!" declared Toby.

"But that isn't all the magic," said Mother. "Instead of using their own pollen on their seed boxes, most flowers get it from other flowers."

"How do they go after the pollen?" inquired Toby. "They haven't any legs" (he looked at his own sturdy brown ones).

"My buttercups have yellow wings. They are like the butterfly I saw in the road," said Beth.

"Can they fly, little goosie?" demanded Toby.

"I didn't see them fly," admitted Beth.

"Toby," said Mother, "if your feet were fast in the ground, and my feet were fast in the ground as the buttercups' roots are, and I had something you wanted, how would you get it?"

Toby's dark brows puckered. He was thinking hard. All at once his face grew bright.

"I'd send Beth," he cried.

"Many flowers have just such a plan," said Mother.

"But I might get tired," objected Beth.

"Oh, I'd give you a cookie for going," laughed Toby showing all his white teeth.

"The flowers give their helpers a drink of sweet juice instead of cookies," said Mother.

"Was that what we tasted in the honeysuckles when they bloomed?" asked Toby.

"Yes, Toby mine. Now, can you tell who the helpers are that go for a sweet drink from flower to flower, and carry pollen as they go? You look too, Beth."

The children looked far and near across the meadow.

"See the butterfly on that thistle," remarked Toby.

"So pretty," agreed fat little Beth, "but the poor daisies are just full of bugs."

"Buzz! Buzz!" A bee flew close to Beth's cheek. She was much frightened.

"Stand very still, dear, and see what the bee wants," suggested Mother.

"Why, he's smelling my buttercups!" Beth's eyes were big with surprise.

"And drinking their sweet juice!" Toby's eyes grew even wider as the bee bumbled into the very center of a flower. "Why, Mother, could she be carrying pollen? Look, it's all over her!" (Toby was shouting, he was so excited.)

"Let's lay the buttercups down till the bee goes away," said Mother and while we wait, we can talk it over. The butterfly on the thistle, the insects Beth saw on the daisies, and the bee are all helping the flowers to get pollen for their seed boxes."

"And they are all getting good sweet drinks from the flowers, but how do they know it is there?" asked Toby.

"Perhaps the flowers' bright colors call them," said Mother.

"I'm going to hunt for ripe seeds," said Toby as they walked homeward.

THEIR TABLE MANNERS WERE PERFECT
*Gentleman, in particular, was well-behaved at table and a visitor at mealtime three times every day*

# CAMPING with CHIPMUNKS

by Lucy B. Fraleigh

*Photographs by P. A. Fraleigh*

It was June and the Adirondacks beckoned to us with all the allure that is theirs in June. They meant the breath of the out-of-doors, the tent on Indian Lake, the joy of Nature above, below and all about. But, perhaps, this June, they meant a little more because we were going back to friends; to campmates of the year before.

Now, to be sure, these companions of the long summer days were only chipmunks, but as camp companions, with their droll little ways, they have many advantages over some humans one might select to share the life of the open. We had not come at this friendship that we were eager to renew in a day or in a week. In truth, it was all the more valued for this reason, and the confidence of our entertaining little friends all the more secure.

Our first proffer of the hand of comradeship had been a gesture in the form of food, tendered in a shallow birch bark box. At first this feeding station was on the ground, but in a week was promoted to the table. From then on it was approached by a definite route along a stick nailed from tree to table to bridge the gap.

Our friends soon learned that when we sat at the table, we were apt to have better tasting things to eat than was their ordinary fare. They would then frequently leave their box to come over by our plates, looking up into our faces with an enquiring expression which plainly said, "Where's mine?" Sometimes the boldest would wait for us to get his share ready for him, if we were careful in our movements. More often, however, he would run down from the table again, and be back in a jiffy, ready to seize from our fingers whatever we held for him. The first of these successive trips to the table seemed to say, "Get my dinner ready for me; I'll be right back," and the second, "Here I am again, what have you for me?"

They would always readily eat prune pits from our fingers, since that was one of their favorite foods. Of course most of these were carried off to be stored for later use. The usual number carried at once was eleven, the cheek pouches being filled alternately until there were five in each; then seizing the eleventh between the teeth, they would run home. After taking a prune pit from our fingers, they would often expect another, and turn back to get it. Since the odor of prune remained on our fingers, they would apparently mistake finger for prune and would bite, though never very hard, because as soon as their mistake was discovered they would stop biting, and only lick off the prune taste with evident relish.

PIE CRUST WAS A DELICACY

*They loved sweet things and would do anything for a piece of chocolate cake*

PRUNE PITS WERE FAVORITE FOOD

*They would carry away eleven, five in each cheek and one in the teeth*

Having watched for so long the four or five chipmunks which ate with us and played with us, we came to know them individually, owing to various small distinguishing characteristics, and discovered where each made his home. We gave them names; "Spotted-nose" who had a tiny extra black mark, the size of a pinhead, on the tip of his nose; "Lop-ear," one of whose ears was usually folded back; "Baby", who looked smaller than the others; and "Gentleman," so-called because he was a perfect specimen in every way, his coat sleek and shining, brighter than that of the other chipmunks, his tail long and full, his table manners perfection, and his supremacy undisputed by the others. He seemed to consider himself owner of the food box and table, and always succeeded in driving away the rest of them. That was one thing that troubled us; although all were members of our family, the chipmunks would not show a family spirit regarding each other.

There was seldom a battle; the one who decided to be the agressor always won, sometimes chasing the other for a considerable distance before returning to finish his meal. The one who was feeding seemed always to sense the approach of another chipmunk much sooner than we could. We knew that the rival was on his way by the very attentive attitude which the chipmunk assumed. He would listen tensely, sometimes holding the same pose until the second appeared, but often hastily resuming his eating, stuffing as much as possible into his pouches while he had the chance. Then in a few seconds, sure enough the second little head would appear above the rim of the table, and the same old performance be repeated. The sudden movement made by the agressor in such a situation seemed to frighten the other almost completely out of his senses, for the latter looked not upon the order of his going, but made a wild leap. I have seen one make a frenzied spring in the air and turn turtle before landing safely on the ground on all fours. At another time, one leaped directly into the wooden box in which we kept our knives, forks, spoons, plates, etc. That did not seem to concern him particularly for he simply leaped out again and ran on down the table.

BUSY EATING THE LOWLY SPUD

*Potatoes were nailed to the tops of posts where the chipmunks struggled to dislodge them*

Gentleman was our favorite, for he would do all sorts of things for us. He it was who seemed to learn mealtime better than the rest, and, besides his in-between trips to the box, would come regularly three times a day up to our plates. We thought perhaps he associated the sound of rattling kettles with food. We also formed the habit of calling him, and it certainly seemed as though he answered, for

THE BIRCH BARK FEEDING BOX

*Into this was placed their daily fare and here they ate after a visit to the family table*

we would hear his "chirk, chirk" coming closer as we called, until he reached the table. We would hear him "chirking" sociably in the early morning, and when he kept it up persistently, we used to like to imagine (though of course did not believe) that he was calling us to get up and get his breakfast. Then later in the summer, when it was nearly dusk at supper time, and all good chipmunks were in bed, Gentleman would still come and have his supper with us.

We experimented somewhat to see what they would eat, both of natural foods and those that were strange. Since there were no nuts at that time, we could not discover what they had in that line. One of their favorite foods about camp was the little red berry of the American yew which was plentiful during part of the summer. It was most amusing to watch one of them pick these, standing on his hind legs and stretching up high to reach a luscious red berry which hung temptingly just out of reach. Then sometimes one would try to walk out to the end of a branch for a particularly large red one, but the light branch would not bear his weight and down would tumble the chipmunk. Then he would try jumping for it, grabbing hold of the branch and almost succeeding in getting the berry, when, alas! the thing would spring back again and the whole performance have to be repeated.

They were also fond of mushrooms, as we discovered one day by their eating some which we had collected in the woods and left on the table to be cooked for our own supper. We never saw them attempt to eat any poisonous specimens, although there were some about.

There was little in the line of artificial foods which they refused to eat, and we regretted that they showed poor judgment by laboriously carrying away such perishables as bread and cake for future use. They would take away any quantity of bread, if nothing better was offered. But they much preferred cake, and there was little that they would not do for the crumbs of fresh chocolate cake. In fact, anything chocolate appealed to them immensely. One of them got in the chest one day and attempted to carry off half a cake of bitter chocolate. He was making very good headway, too, when we interrupted and made him take it a piece at a time from our fingers. Fudge was about the best thing they knew. Once they even climbed on my lap for it. It caused them one difficulty, however. They tried to fill their cheeks with it to take it away, but by the time they got them partly filled, the fudge would mysteriously begin to dissolve and disappear, and no matter how fast they pushed it in, their pouches would not fill up. They could not seem to understand it.

For some time they never bothered the potatoes, but after a few weeks discovered that they liked them. They bit out little pieces and discarded any which had a trace of skin on, so that there was considerable waste. The other pieces were stored in the pouches and carried off. After finding this out, we nailed a potato to the top of the post on which we wished to take chipmunk pictures, and they tugged away trying to get it off, finally giving it up and biting out the pieces instead. I was astonished on one occasion to see the size of the potato which one chipmunk attempted to drag to his

storehouse, partly by rolling and partly in his mouth.

We had one watermelon during the summer, and our pets surely thought they were in clover when they saw all those seeds in their box. They also carried away walnut meats, peach pits, lemon seeds, puffed rice candy, and salted peanuts. It seemed strange to us, however, that they preferred peanut butter to peanuts, and would get into the jar of it whenever our carelessness offered opportunity.

After eating such sticky things as jelly or candy, a chipmunk would usually wash his face and forefeet, much as a cat does, sticking out a little pink tongue to lick his feet, which he then rubbed over his face, sometimes even back of his ears, pushing these forward as he scrubbed vigorously. We often saw them do this when they had not been eating sticky things, frequently just before eating, so they evidently also believed in bathing on general principles.

Spotted-nose had his home just the other side of a brook, which he easily crossed on a large rock that was normally out of water. Last summer, however, there was so much rain that several times the brook rose very high and roared down in a swift current which no mere little chipmunk could hope to cross. On such days we would see him scampering about on the other side, pausing occasionally to look at the roaring flood which separated him from an easy dinner. Once we tried to place a bridge over for him, but he either could not learn or would not use it.

I have mentioned that we nailed a potato on a post for picture-taking purposes. This post was not put up until along toward the middle of the summer, after the chipmunks had formed the habit of going up a certain tree and over to the table for their food. After putting up the post beside a different corner of the table, we transferred part of the chipmunk food to it, leaving some in a sort of trail to lead from the old to the new feeding place. It was very funny to watch their reaction to this. They would eat a little from the trail, but after reaching the post would not climb the eight or ten inches necessary to reach more good things to eat. On the other hand, they investigated this strange new post from the ground up, and discovered food at the top. For a long time they continued to climb to the table, eat there, go down again, climb to the post and finish their meal. It took them two or three weeks to learn to save themselves energy by going across the table and thereby climbing only a few inches.

But all good summers have to end, and we felt very sad as we broke camp and watched our little playmates scamper about among the piles of tents and boxes. We thought the saddest part came in filling the birch bark box with their favorite foods for the last time, and knowing that it would be filled no more for many months. But there was one thing which made us feel even worse. We had taken down the table and hidden it in the woods, ready to be used again next year. Although the box of food was on the ground, our attention was attracted to Gentleman, who had climbed up the same old tree to the place where the little stick had formed a bridge. He stood there as if ready to jump to the table as usual; but there was no table, and his order of procedure was completely upset. Many times he did this, then finally went into his box on the ground and ate. As we gave our last farewell look about, we saw him eating there, one of those little wild creatures without whose quaint presence the woods would not have been complete. So you see why June beckoned to us.

# A Bird Fountain for "Jim"

by Mildred Kinch Lusher

When "Jim" Borland sits at his desk writing his daily Nature column for his Franklin, Pennsylvania, *News-Herald,* he can look across to the City Park and see a testimonial to his service to his fellow citizens and to the feathered friends of us all. Seemingly taking its inspiration from the homing instinct of birds, Franklin was one of the pioneer cities in the Old Home Week movement, and "Jim" was its local leader in spurring the former citizens to fly homeward and in entertaining them when they arrived.

Next February "Jim" Borland will have completed fifty years in the newspaper business, publishing the newspaper that he started as a boy of sixteen. For the past several years he has conducted a column devoted to Nature subjects, has written two Nature books and has been active in Nature clubs. When, then, it was decided to reward "Jim" in some small measure for his untiring service to Franklin, a bird font was quickly chosen as the most appropriate testimonial.

*"As a testimonial to James Brown Borland, Bird Lover, and In Commemoration of the Old Home Week of 1925, of Which He Was President, This Bird Font Has Been Erected by Citizens and Former Residents of Franklin"*

So now there stands in Franklin's City Park a statue of a small boy pouring from the tipped vase in his hands a welcome trickle of water for "Jim's" friends to enjoy in the bowl below. The font was unveiled by Mr. Borland's grand-niece and nephew, Nita Mae and Ralph Murrin, at a ceremony which brought together many old-time newspaper friends and fellow citizens.

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Miss Clelia Paroni, *Supervisor of Nature Study, Berkeley, Calif.*
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## Nature Treasure Hunts

Treasure hunts are probably most frequently used for purely recreational purposes. If properly organized and run they, however, offer splendid opportunity for educational development. The method here suggested is different from the procedure usually followed but it is believed that it possesses strength where the usual method has weakness and it retains the recreational feature with an increase in educational opportunity.

The usual procedure in a treasure hunt is for an individual or group of individuals to lay a trail over which others will go at a later date. This trail is usually laid in the same direction as that which will be followed by those using it later. Places in the trail are marked variously by trail signs or by hidden directions which direct those following to other hidden signs. For example, there may be found "under a piece of limestone bearing three fossil mollusks" a note which directs the individual to "go further down the road to the east approximately one hundred feet to a piece of granite beside a clump of orchard grass". Under this piece of granite will be another note directing the individual elsewhere. These directions continue until a final goal is reached where may be hidden a treasure of variable value. Often these directions are made more or less enigmatic or their interpretation may be based on considerable general knowledge as was the case where one trail direction said, "Look for a tree similar to the one mentioned in 'The Gold Bug' as of value in finding the treasure there described. On its north side you will find the next". One not knowing "The Gold Bug" or not being able to identify the tulip tree would here lose the trail. One with such knowledge could proceed satisfactorily. Competition may be introduced between individuals or groups by timing the individuals over the trail. Not infrequently competition is maintained by turning everyone loose on the trail at once and seeing which of two sides can actually find the treasure at the end of the trail first. There is considerable difficulty in either of these cases since the laying of the trail is a great time consumer and since the trail may be easily obliterated by the first individuals passing over it. Furthermore it is surprisingly difficult to lay a trail in which all of the directions are absolutely accurate.

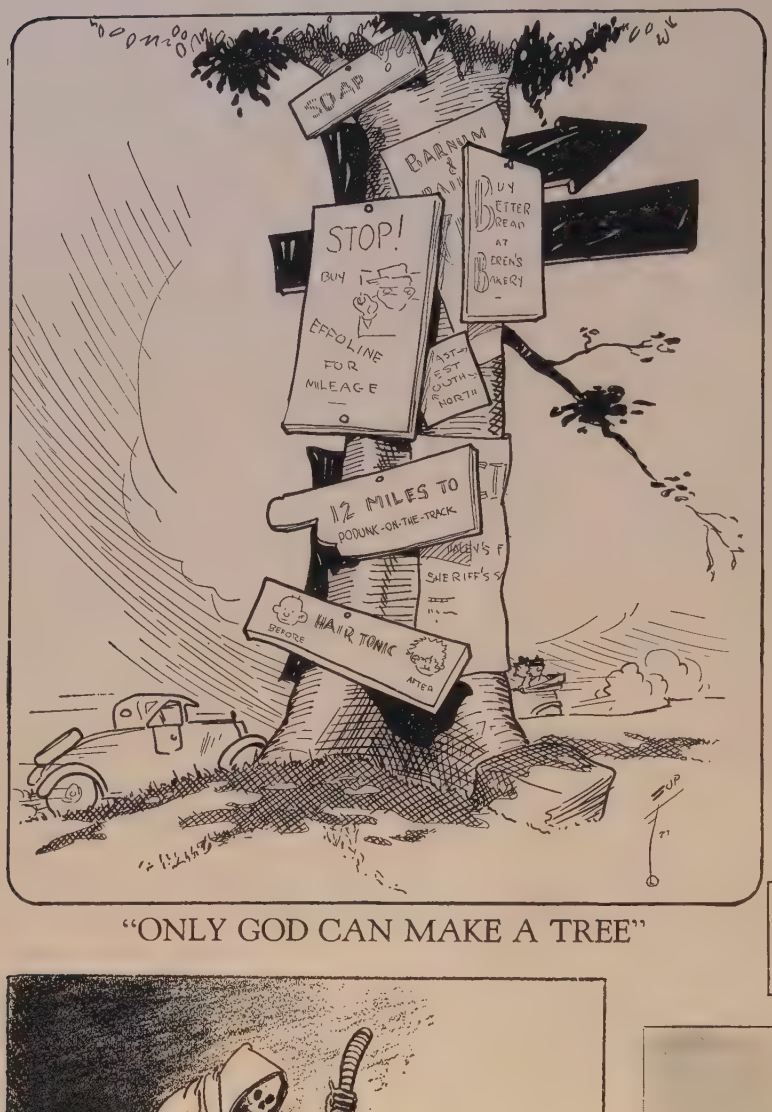
The suggestion which I wish to make cares for these objections in that there is no necessary preparatory work to be done and all individuals have equal opportunity throughout the trail. The only additional difficulty arises in the necessity of having two leaders.

At the beginning of a treasure hunt such as I wish to conduct, let us divide the group into two and assign one group to one leader and the other to the other leader. A most convenient unit would allow twenty to a leader though a smaller group is desirable and groups up to a hundred have been handled satisfactorily.

The two leaders agree to meet at a given point at a given time possibly a quarter of a mile away in an hour. The leaders then divide their groups into smaller groups, a convenient number of groups being four. The two big groups move a short distance apart and one of the smaller groups of each group selects a place where they are to hide their treasure or a certificate entitling the finder to the treasure. If all individuals apparently hide a treasure the opposing side will be unable to watch and see where the treasure is actually hidden. When the treasure site is chosen a second of the smaller groups of each side moves on and selects a site for a unit of the trail and there hides a note which directs one to where the treasure or certificate is to be found. The third group moves on further and selects a site where they hide a direction which leads to the note hidden by the second group. This continues laying the trail backwards until the agreed meeting place is reached each of the smaller groups taking turn in selecting sites and the leader being present to see that the notes are correctly given and the trees or herbs involved are correctly named. When the two big groups have met at the agreed place they change leaders and each side follows the trail laid by the opposing side. Competition is best attained by dividing these groups into two sides and allowing the finders of the notes to retain the directions as evidence of success. The side finding the greater number of notes naturally wins. It will be better if in following the back trail the leader read a direction to the group as soon as it is found and at a signal send the individuals off in search

*(Continued on page 135)*

# Amateur Cartoonists Defend




"ONLY GOD CAN MAKE A TREE"

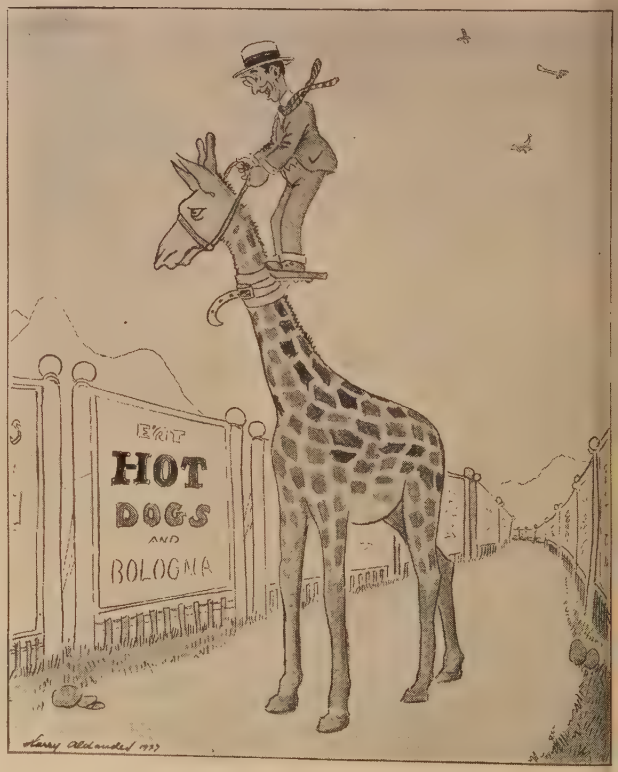
**First Prize for the cartoon at the left goes to Richard W. Tupper, Mills Bldg., Washington, D. C.**

More than five hundred cartoons were received in the Amateur Class of the American Nature Association's Outdoor Good Manners Cartoon Contest. On these pages are shown the cartoons of the winners of the first three prizes,—$25, $10 and $5,—and three of the cartoons receiving honorable mention. These last three were selected for publication in this issue, not because they are necessarily the best of those given honorable mention, but because they express several phases of the desecration of the out-of-doors against which the contest was directed. Other honorable mention cartoons will be printed as space and opportunity permits.

Other honorable mention prize winners were: Carl S. Smith, Wilmore, Kentucky. Charles S. Lynch, East Hampton, L. I., N. Y. Raymond Conklin, 2111 Forest Ave., Lansing, Mich. William Walter, 3027 Newark St., N. W., Washington, D. C. Frank Kean, 32 Garden St., Brighton, Mass. Henry Smith, Box 786, Bloomington, Ill. Marguerite Gode, 4228 Hickman Ave., Des Moines, Iowa.

**Honorable Mention for the cartoon below awarded to Harry Alexander, 513 B. St., S. E. Washington, D. C.**

**Honorable Mention for the cartoon above is awarded to Gilbert Wright, 1202 E. Main St., Carthage, Illinois**




*A. D. 1937* The optimistic Nature lover borrows a giraffe from the zoo and takes a Sunday stroll.

# The Beauties of Nature

**SECOND PRIZE for the cartoon at the right goes to Riley Johnston, 580 West Maple Street, Wabash, Indiana**

THERE were several interesting things about the amateur contest. The entry list was large and every state represented. There were also entries from Syria, South Africa, Hawaii, Philippine Islands, Canada and Porto Rico.

It is interesting also that among the prize winners, and those given special mention, eight were students of the Washington School of Cartooning. This school cooperated in sending out the message of the cartoon contest.

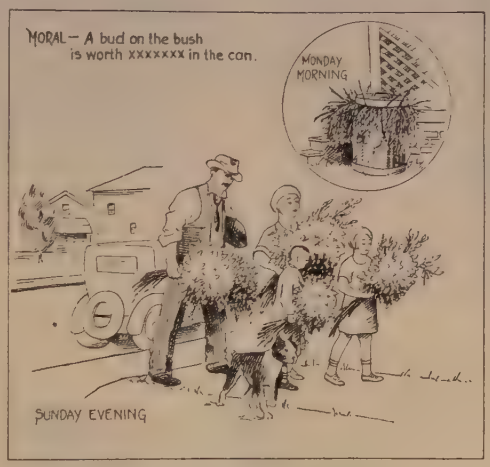
Copies of "Cartooning Made Easy", by Charles Lederer, are given to the first two prize winners through the courtesy of the Judy Publishing Company.

Mr. Freeman H. Hubbard editor of *Cartoons Magazine* will enter each one of the thirteen prize winners as a subscriber to his magazine for one year. Also, through the kindness of Mr. Hubbard, the American Association of Cartoonists and Caricaturists will give a free technical letter of advice to the winners of the three first prizes.

The American Nature Association thanks contestants one and all, and wishes there might have been five hundred winners instead of thirteen.

THE FARMER TURNS THE TABLES

**HONORABLE MENTION for the cartoon below is awarded to Lowell Childress, Charleston, W. Virginia**

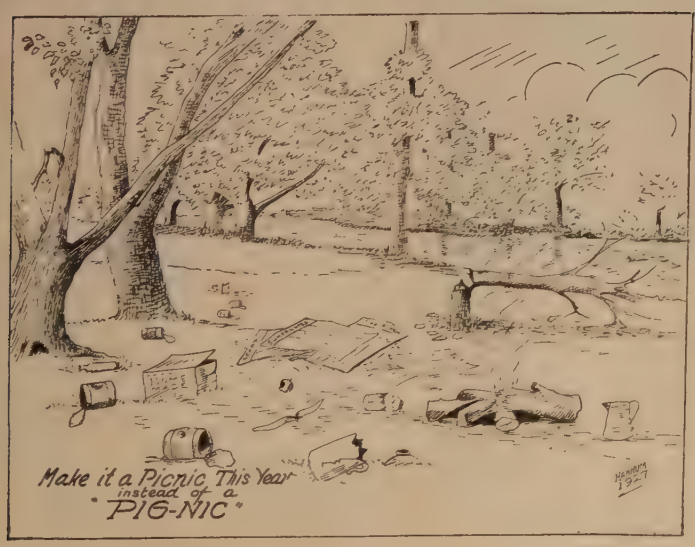



## Special Mention

ALTHOUGH they were not among the prize winners, special mention should be made of the cartoons submitted by the following:

John Leeper, Phoenix, Arizona; Gostan Bandikian, Antilyas, Syria; Martha Rose Scott, Indianapolis, Indiana; Marc Nicolet, Milwaukee, Wisconsin; Leila Bartholemew, Indianapolis, Indiana; Wilkes Fisher, Missoula, Montana; William L. Addkison, Jackson, Mississippi; Glenn H. Jones, Bellingham, Washington; William E. Jary, Jr., Fort Worth, Texas; Carrie Isabel Akers, Fort Wayne, Indiana; Lila B. Hetzel, Somerset, Pennsylvania; H. G. Turnbow, Ontario, California; Herbert Buerger, Cleveland, Ohio; Harry Davidson, Philadelphia, Pa.; Henry C. Wild, Denton, Maryland; Masura Nakayama, Honolulu, Hawaii; John W. M. Hard, Aledo, Illinois; Evelyn A. Wahl, Easton, Pennsylvania; Marad Serriov, Palo Alto, California; M. Frances Brown, Chicago, Illinois; H. S. Dampman, Philadelphia, Pennsylvania; Raymond Hatman, Scranton, Pennsylvania; Billy Fullerton, Huntington, West Virginia; Solomon Cohen, Washington, D. C.; Walter Beerkircher, Philadelphia, Pennsylvania; Stanley E. Matthews, Ogunquit, Maine; Joseph T. Dillon, Atlantic City, New Jersey; August Pilaja, Lead, South Dakota; P. A. Uhlmann, Cincinnati, Ohio; R. B. Riordan, Washington, D. C.; Thomas T. French, Caruthersville, Missouri; John Zelinka, Ashley, Pennsylvania; Gordon Travis, Compton, California; Harvey H. Shepler, Oxford, West Virginia; Seymour Kail, Seattle, Washington; Marguerite Gode, Des Moines, Iowa; Alvin Stadtmiller, East Akron, Ohio; William Turner, Regina, Canada; Howard R. Stacks, Jr., Battle Creek, Michigan; Glynn Reger, Sacramento, California; John S. Garth, Long Beach, California; Clarence I. Driesbach, Allentown, Pennsylvania; C. F. Fuechsel, Jr., Philadelphia, Pennsylvania; Thurston Gentry, Long Beach, California; A. Gail Combes, Tampa, Florida; Hazel Smith Kerr, Chicago, Illinois; F. Paulsen Wilkinsburg, Pennsylvania; Thomas K. Menefee, Lynchburg, Virginia; Oliver S. Cole, Wallingford, Connecticut.

**THIRD PRIZE for the cartoon below is awarded to C. H. Hannum, 5916 North 24th St., Omaha, Neb.**



# Nature News and Views

## More Twin Trees

Here is another entrant for twin tree honors sent in by Mr. F. S. Alden of Cedar Rapids, Iowa. The trees, however, are growing on the Scenic Loop about sixteen miles from San Antonio, Texas, and were photographed by Mr. and Mrs. H. C. Braden of that city. They are joined together by a common limb above but although they are growing together are believed to be separate trees at root.

## Bird Eyesight

After experiments by scientists in Great Britain several conclusions were reached about the ability of birds to see. Among these are:—A thrush sees a worm writhing in grass 100 yards off. A sparrow 50 yards away sees a dropped crumb or pea and immediately darts to it. The swallow, skimming along 40 miles an hour, marks down gnats 100 yards ahead. A hawk, poised 300 feet above a tangled brake, detects a mouse through heavy growth. Eagles and vultures possess supertelescopic sight and their vision is even keener.

## A Park Museum

Work has begun on the new museum at Bear Mountain, Harriman State Park, where the educational activities which have grown up there in the past few years will be centered. It will be largely an outdoor museum, with exhibits of the native flora and fauna of the Hudson Highlands, in place, on trails in the ten acre tract to be devoted to the purpose. There will be one building, however, a structure 78 by 24 feet, to cost $7,500, provided by a grant from the Laura Spelman Rockefeller Foundation, secured by the American Association of Museums, through its chairman, Chauncey J. Hamlin of Buffalo. This will include two exhibit rooms, laboratory and work room, and office. The direction of the museum has been undertaken by the American Museum of Natural History, in New York.

## A Tricky Shadow

Turning on his office light one night, Dr. R. R. Garvey of Elkin Hospital, Elkin, N. C., was surprised to find the room occupied by the gentleman whose photograph he took and sent to Nature Magazine. The explanation of the profile is simple,—merely a handful of books thrown casually atop the bookcase.

## A Black Oak Gall

One would almost think that a tree so deformed as the one pictured here would cease to prosper, but Charles A. Clark, who sends in the accompanying picture finds the tree in good health. The black oak is about a foot in diameter below the gall, which is just three feet in diameter and nearly spherical. The tree is growing on the grounds of the Connecticut Agricultural College at Storrs, Connecticut.

## School Gardens

David A. Ward, Superintendent of Schools, Wilmington, Delaware, in a recent number of the Journal of the National Education Association tells of the three-fold value of gardening. He says in part, "Measured by the criterion of usefulness, school gardening should have a future. There are three educational values which the garden, properly used, will contribute to the child's development,—the utilitarian, the esthetic, and the moral." Dr. Ward gives an interesting history of the movement and predicts growth.

### *Nature Films*

The home motion picture camera nd projector is fast gaining wide opularity to the end that a demand as been created for motion picture els for home showing and available a moderate cost. Some of the most teresting Nature film series available e distributed by Bell and Howell, 301 Larchmont Avenue, Chicago. he Ditmars natural history series nd the Pillsbury series on plant and owers are of interest to every Nature ver. Information about them can be btained from Bell and Howell. Just ention Nature Magazine.

### *A Nature Trail*

Noblesville, Indiana, has estabished the Nature Trail idea in its cal park and much Nature interest as been awakened by it. The trail is arked by white stakes at appropriate aces with tags giving brief data bout the subjects nearby. The trail revised each week by the committee charge.

### *New York Bird*

According to a report from Mrs. harles Cyrus Marshall, of the New ork State Federation of Women's lubs, votes taken under the auspices f the Federation have given the blueird first place in the race for State ird. Bob-white was a close second, nd although the robin and oriole ere both popular, they were left beind in deference to Virginia and Maryland respectively. Several groups lected the gold finch, a musical club oted for the thrush and one group avored the kingbird. Legislation esablishing the bluebird as the official ate bird is planned.

### *For Carolina Birds*

President Coolidge, by a recent Executive Order, has set aside a tract of bout 2,350 acres in Jasper County, . C., as a preserve and breeding round for native birds. The area emraces certain abandoned rice lands elonging to the United States abutng on the Savannah River, near Saannah, Ga., and is to be known as ne Savannah River Bird Refuge. The ew reservation has been placed under ne administration of the Biological urvey of the United States Departent of Agriculture. It will be unlawul for any person to hunt, trap, capure, disturb, or kill any bird or wild nimal of any kind whatever, or take r destroy the eggs of any such bird, r to injure, molest, or destroy any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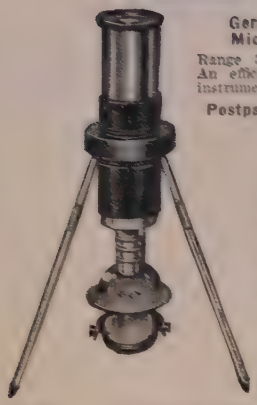

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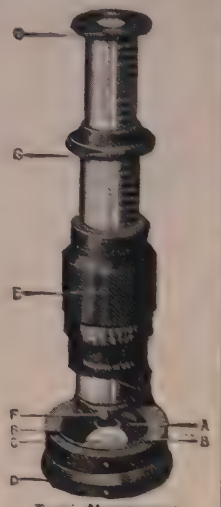


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## *A Proper Fine*

Pennsylvania has a law prohibiting the gathering of flowers, ferns, shrubs and trees along a private or public road and provides for a heavy fine and even imprisonment for violators. Recently a motorist stopped along a highway in Bucks County and started to help himself. A traffic officer appeared and put him under arrest and a justice of the peace backed up the officer with a fifty dollar fine. This was a sufficiently high price to pay for pilfered plants but not too high if it will serve to stop vandalism.

## *Roosevelt Memorial*

Many bird lovers joined recently in a simple ceremony incident to the dedication of a memorial to another great bird lover who has passed,—Theodore Roosevelt. At Oyster Bay, on the grounds of the bird sanctuary owned and maintained by the National Association of Audubon Societies, a bronze memorial group was unveiled. Dr. T. Gilbert Pearson, president of the organization, delivered the dedicatory address.

## *Carry Your Shovel*

If you are going to camp in a National Forest in the California district this summer be sure and equip yourself with a shovel and an axe. Acting under authority from the Secretary of Agriculture, S. B. Show, District Forester, has established this requirement for each pack outfit or automobile. It is an essential detail of precaution against fire and preparation for the need of fighting a forest fire.


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Without smearing, smudging or blurring the paper. Writes with any color of ink.

### Requires No Blotter

The ink dries as fast as you write, because the flow is fine, even and uniform.

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### An Instrument of Refinement

In appearance it is the equal of writing instruments which sell for a great deal more. Its beautifully highly polished finest quality of hard rubber, its 14 Kt. solid gold point and feed, safety screw cap, nickel self-filling lever and clip make it an instrument of distinctive elegance and refinement. Made of black Hard Rubber—each Inkograph is designed and finished to please the eye and fit the hand of all.

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Try the Inkograph—remember, all we ask you to do is try it, for if it does not prove thoroughly satisfactory and if it is not handier and does not write smoother and is not far superior to any fountain pen you ever owned, whether it cost $5, $6, $7 or $8, return the Inkograph to us and we'll refund your money—no questions asked.

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Inkograph has proven so satisfactory and has elicited considerable favorable comment am enclosing money order, please send me three more. T. J. Trow, Traveling Claim Agent, Joplin, Mo.

The Inkograph fully justifies all claims you make. I own a Waterman but Inkograph is far preferable. Frank R. Sargent, Oakland, Calif.

You have one of the best writing instruments I ever used regardless of price. I use the lowest grade stationery and there is never a blot or scratch because of it's round smooth point. It is a wonderful invention. L. H. Orley, Albano, Va.

Oh boy, I am tickled skinny to have the Inkograph, it's a darling. I can now make carbon copies in taking orders and send original in ink to factory instead of a pencilled sheet. It surely flows over the paper as if it was grease instead of ink. No trouble at all and a thing I could not do before to trace straight lines very fine and clean. No smear, no muss of any kind. It's just great. E. A. Simms, Jersey City, N. J.

My Inkograph is the smoothest writing instrument with which I have ever written. That is saying a lot. I am a teacher by profession. I have a $7.00 pen and another that cost more than the Inkograph, but Inkograph is better than either. It is the greatest improvement in writing instruments since the Babylonians recorded their thoughts on clay tablets with a triangular pointed reed. John R. Atwell, Chadwick, N. C.

My Inkograph is the first and only writing utensil I ever owned that I can use with pleasure. To be without it for any time would upset my business day. It has always worked perfectly. I have never had any difficulty with it. Arthur L. Fox, Centerville, Mich.

I am a bank teller, have used all kinds of fountain pens but can honestly say for my work I never found a pen so easy and tireless to write. You can pick it up any time in any position and write immediately and all numbers and words will be the same. Try and do it with any other pen. My buddies all agree that it is best for our work. O. B. Morley, Allentown, Pa.

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I am very well pleased with my Inkograph. It is just what I have been looking for. I have had several ink pencils but nothing like the Inkograph, it writes like the point was greased and it makes no difference what kind of paper, it is fine for shipping tags. S. T. Jarrett, Harrisville, W. Va.

The Inkograph is all that you claim it to be. Enclosed find order for two. Robert Heller, Craigsville, Pa.

The Inkograph, I am thoroughly convinced, is the best writing instrument I have ever used. It is sure, sane and clean and always ready to use. I am very well pleased with it. J. E. Rampton, Pensacola, Fla.

Received my Inkograph, surprised to know how well I write with it. The Inkograph a wonderful little writer, it's friend now for good penmansh I am writing this letter with can you tell the difference tween Inkograph and pen lette I Can, is my answer.
C. R. Fuller, Patterson, I

I received my Inkograph w which I am writing this ter. I have purchased at l one dozen ink pencils. Yo seems to be the only one t gives perfect satisfaction. I lieve you have solved the prob of the perfect writing instrume
Dr. Richard T. McLa Dunkirk, Ind.

The Inkograph is truly the b pen I ever had the pleasure to barring no price or make of p after I take into considerat the high price I usually paid a Parker, or a Waterman pen cannot see how such a low pri pen as the Inkograph can be on the market and give such usual service. Harvey L. Winst Brentwood, Calif.

In making out local requi tions, it is necessary to make original and two carbon copies very heavy paper, and the In graph does this twice as well the hardest indelible pencil, is much neater and the original much more legible. Wm. L. Fortney, Placerville,

Your Inkograph is everythi you state. It is just wonderf So send me two more. Arthur Ollcott, Tucker, La.

Gave pen thorough tryout. closed find sample of work I h to perform. Have been usi pencil. Never got entire sat faction. Hard pencil makes ori inal too pale and soft pen makes poor copy. I am hig pleased. S. M. Cooper, Inqu Division, P. O., South Bend, I

I found the Inkograph all y represent it to be and I was v well satisfied with it. I made great mistake when I bought Inkograph, as I did not take Loss or Theft Insurance on pen, for the pen is gone. I writing this to ask that you se me another Inkograph by ret mail, charges C.O.D. I can r ommend the Inkograph very hig ly to anyone who needs a p which will stand up under v hard usage George B. Moo Columbia, Fla.

It sure has improved my ha writing—I never took home medals for penmanship but I almost read my own writing si I got this pen. M. F. Johns Medina, Wis.

I want to thank you for the turn of my Inkograph pen, wh you repaired for me. I feel ra er lost without this pen in pocket. I prefer it to any I ever carried principally beca of the ease with which one write with it, not having to careful whether you slide the to the North, East, South West, it flows freely in all dir tions. Wm. B. Brown, New Yo N. Y.

Received my Inkograph same is filling a long-felt wa Kindly send two more of the sa style by parcel post collect soon as possible. Theodore Priestley, Akron, Oh

I bought one of your pens year ago. You sure build best pen on the market to my tion. Frank R. Ellsworth, Far N. D.

I wouldn't take $5.00 for pen I am writing this letter wi I have a good fountain pen don't write any more with it. am proud of the Inkograph that I can say this to you mean every word of it. R. H. Wilson, Beckley, W.

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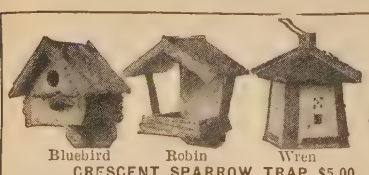

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## *Report on Bison*

Satisfactory conditions among the remaining herds of bison in the United States is reported to the American Bison Society by its president, Edmund Seymour, and published in the attractive Report of the Society for 1924 to 1926. Having achieved notably in behalf of the bison, the Society has not limited its efforts to these great mammals alone, but is active in the interests of all North American big game. The chief issue at hand, Mr. Seymour points out, is the establishment of preserves for the prong-horn antelope, the saving of which is not as simple as might seem. The report also covers the buffalo situation in Canada and the difficulties facing the European bison in Russia.

## *Nature Correspondence*

Fred A. Barkley, Box 861, Norman, Oklahoma, would like to establish Nature correspondence with English-speaking young people between the ages of seventeen and twenty-one, resident in foreign countries and interested in Nature.

## *Another Collector*

Ray W. Bracher of 400 Brown Avenue, N. W., Canton, Ohio, would like to get in touch with fellow members and others in his vicinity or elsewhere who are interested in exchanging butterflies and moths.

## *Nature Lectures*

Members in California may be interested in the series of natural history lectures given by Alfred Cookman, president, of the Nature Club of California. He has ten different programs and will be pleased to supply any information about them. His address is 938 East Dryden Street, Glendale, California.

## *A Trapper Cured*

Charlie Andrews of Stirling City, California, has been a trapper for twelve years. Now he is through and has pulled up his trap lines to prove it. This is how it came about, according to the Chica (Cal.) *Record,* a clipping from which was sent in by Ruth Lammiman.

Charlie was making his rounds and as he approached a coyote trap he heard moans. Creeping through the brush he discovered a cinnamon bear cub, its forefoot caught in the trap. The mother bear was nursing the youngster and another cub looking on much puz-


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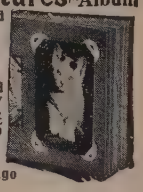

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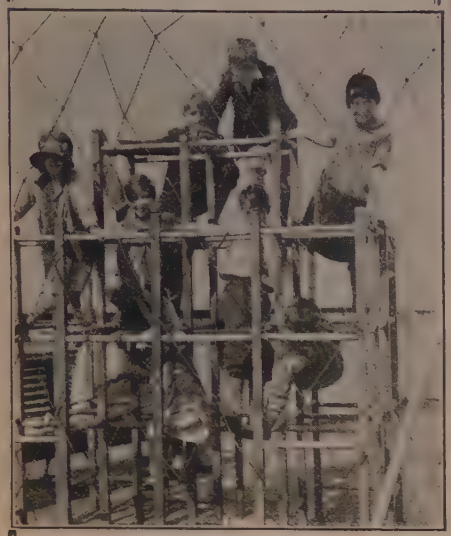

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zled. Charlie's first impulse was to free the cub, but a mad mother bear promised to be too much for one trapper with a pistol. Besides, he wanted to free the cub, not injure the family. The only way he could see out was to put the cub out of its misery so he went for his rifle and finally did what he felt was best. Rearing on her heels at the sound of the shot, the mother bear, growling in anger, circled about trying to find the attacker. Andrews crawled away and took to his heels.

"I'm through with traps though," he declared. "The mother's moans when I shot the cub were too human. I'm done boys, that made me sick."

## *Nature Treasure Hunts*

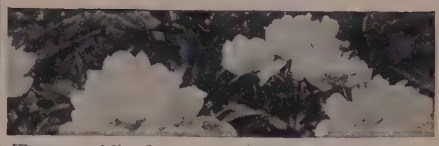
(Continued from page 127)

of the next trail sign, or the next note. This makes it possible for all to start with a fresh chance at each unit and for the leader to point out to the whole group anything which may be of interest at that point. Where very large groups are involved it is well to number the members of each competing group so that if the leader says, "twos and threes may go" members with these numbers from each side may compete with less confusion than if all went at once. A few suggestive trail notes are given for those who wish them. Under a clump of Kentucky blue grass might appear a note which reads. "If this is timothy, go 100 ft. south to a chicory plant for the next. If it is Canada blue grass, go that distance west. If it is Kentucky blue grass go that distance east and if it is red top go that distance north." The next note would of course be 100 ft. east. Such directions are possible of infinite variation involving weight of rocks, height of trees, habits of birds and the like.

## *Share Your Flowers*

Material assistance has been given to the movement sponsored by the National Plant, Flower and Fruit Guild by James Montgomery Flagg, who has donated a remarkably effective poster expressing the thought of sharing flowers with those to whom a flower is an event. The artist has pictured


*Brand Peonies Are Prize Winners*



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a little girl in the city street clutching a bunch of withered flowers gathered from the gutter. This poster will be displayed widely to further the idea and, in all cities where the Guild has branches, volunteers will arrange for the distribution of the shared flowers to hospitals, charitable institutions and shut-ins.

### *A Fine Decision*

It is not necessary that a forest fire caused by identifiable carelessness need have its origin on federal forest land to constitute a criminal offense under the United States criminal code, according to a decision handed down by the United States Supreme Court. The Forest Service regards this opinion as of vital importance in connection with the protection of the National Forests from forest fires and strengthens its hand in the prosecution of cases of criminal carelessness.

### *A Wise Bluejay*

Mrs. Kate Holden of Memphis, Tennessee, was puzzled one morning early in July by the antics of a blue jay flying madly among the branches of a wide spreading elm. Watching closely she discovered that the wise bird was taking advantage of a heavy dew the night before and busily knocking the moisture off the leaves and on to its wings, thus taking its morning bath.

### *Oh Wise Judge!*

A foreigner, it is related, entered a courtroom in a town in interior China and was amazed to find the room dotted by beautiful butterflies emerging from a box on the magistrate's desk. He was told that the judge, instead of fining offenders in taels, exacted a fine of so many butterflies that should be brought to the court uninjured to expiate the crime. The judge was asked the reason for this novel penalty.

"The beauties of Nature," he said, "should be an antidote to crime. He who obtains his liberty through the intercession of the beautiful butterflies, and then commits another crime, must be incorrigible. I never have mercy on a second offender."

### *Nature Study Courses*

Nearly a year ago Mr. L. W. Welch of Long Beach, California, put his course in Nature Study and Agriculture in print in the form of folders for each grade. It is a careful and thorough piece of work, which has been tried out in the grade of the Long

Beach schools for several years. The course completed a year ago for the Public Schools of Washington, D. C., by the committee which prepared the report on Nature Study and Elementary Science for the Fourth Yearbook of the Department of Superintendence, is now in print.

This spring Miss Helen Hefferman, State Commissioner of Education of California, put out an Arbor Day Bulletin entitled, "Source Material for Conservation, Birds, and Arbor Day," which will be found helpful by many teachers. Miss Hefferman is anxious to organize a state course in Nature Study for the use of the rural teachers of California.

### *Fosters Nature Study*

The move made by Rev. Joseph Murgas, pastor of a Slovak congregation in North Wilkes-Barre, to bring the children of the parish, and all others who care to avail themselves of the opportunity, into closer touch with Nature, is worthy of special commendation. The pastor has secured a tract of thirty acres where bird and plant life are to be propagated and encouraged, and all phases of Nature fostered for their educational and inspirational value.

### *A Fair Interest*

There are no loaves in the experience of Mrs. F. G. Hobart of Beloit, Wisconsin, but plenty of fishes. For several years, she writes, she has had an outdoor pool eight feet long, six feet wide and eighteen inches deep. One year six goldfish of the five and ten variety were put in on the first of June and on November 4 there were seventy-two, ranging in size from one inch to several inches. The next season the long-tailed variety proved equally prolific. Mrs. Hobart says that the fish were fed liberally with oatmeal flakes each day, that the pond was in the sun and contained such plants as water lilies, water poppies, ludwigia and pyriophyllum.

### *Nature Study Correlations*

An exhibit recently set up by the English Department of the Public Schools, Detroit, Michigan, showed many books, written and illustrated by children in all grades from the first through the sixth, on birds, wild animals, pets, flowers, frost, and like topics. This interesting correlation furnished motivation for composition. A like motivation was given the Manual Training Departments of various schools which turned out 1,000 bird houses this year.


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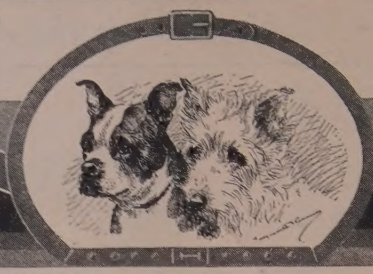


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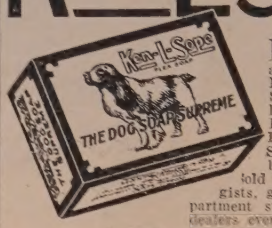


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# FOREST PROTECTION SHOULD HAVE PART IN FLOOD CONTROL PLAN

"REFORESTATION and forest protection will unquestionably enter into any plan for the future control of the Mississippi" says E. A. Sherman, associate forester of the U. S. Forest Service. "Claims that the present flood is due to forest destruction or claims that reforestation has no bearing upon flood prevention are both exaggerations.

"Every acre of land in the immense catchment basin of the Mississippi system contributes, in one form or another, at one time or another, to the flood problem. It is idle to say the scores of millions of acres of forest land within this basin have no relation to the flood problem. The plans for preventing a recurrence of a flood of this magnitude must, as one of their essential factors, include the reforestation of the headwaters of the Mississippi and its tributaries."

Many editors agree that reforestation at the headwaters would help hold back the snow and rain causing a gradual run-off. The editors all agree the flood question will be the big one in the next session of Congress. In the opinion of the *Atlanta Journal,* "If that knowingest of teachers, Dame Nature, were asked the cause of the Mississippi flood she would go back for answer to forgotten years when men were recklessly cutting away forests from the headwaters of the royal river's tributaries. She would show how vast volumes of rain which she intended to be soaked in by her spongy woodlands were left to surge down hillsides, cutting gulches as they went, into streams which broke from their banks with the excessive inpour."

Thirty states are drained by the Mississippi and its tributaries, which prompts the *Pittsburgh Gazette Times* to say: "Never before has the country had in Forest Week such a striking object lesson in support of the principles and objects of the American Tree Association as is afforded by the Mississippi flood."

*The Christian Science Monitor* says: "In the opinion of Charles Lathrop Pack, president of the American Tree Association, the people of the United States have, in the flood situation, an opportunity to learn a lesson which should have been learned long ago. The disaster which has resulted from somewhat unusual conditions this spring only emphasizes, he declares, the lack of foresight which causes millions of dollars in losses every year as a result of erosion due to the destruction of forests which formerly impeded the rush of surplus waters in the vast areas which feed the Mississippi and the lesser rivers which join it in its course. Mr. Pack says it is imperative that forests be reproduced at the headwaters of streams in the great area constituting the basin drained by the Mississippi, the Ohio, and the Missouri Rivers."

"Millions will be spent in relief and in partially repairing the damage that has been done" says the *Philadelphia Inquirer.* "But the great cry will be: 'What of the future?' It is a many-sided problem and out of its study should come some definite recommendations. And at least one of these should have to do with the extreme importance of a broader forestry policy in this country."

According to the *Peoria Journal,* "There is not the slightest doubt that forests absorb a vast amount of rainfall which otherwise would develop floods. The construction of levee districts also diminishes areas of absorption. Floods were not uncommon when the forests were virgin. At the same time, trees are national assets of great value. To assume the contrary is the height of folly."

"Failure to hold the absorbtive surface soil of fields and pastures against the denudation of erosion," says H. H. Bennett, of the Bureau of Soils, "has contributed to a much more rapid removal of the water that falls upon these eroded lands."

"The Bread Basket of the Nation, the Mississippi Valley, must be protected from the flood menace," is the opinion of Charles Lathrop Pack, president of the American Tree Association. "Our population is increasing at the rate of about a million a year. Couple the flood situation and the population increase in your mind. Trees at the headwaters play a big part in flood control, one of the biggest questions before the American people today.

"The census figures, coupled with the flood lesson, put before us a problem the country must solve. This backbone of the nation must not be broken."

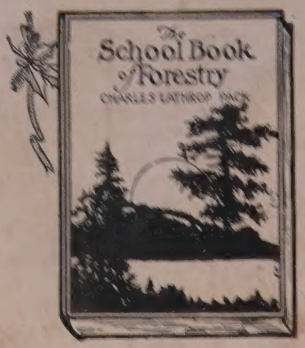
## HELPING REFORESTATION

*IT IS to be hoped that one result of the flood disasters will be renewed interest in reforestation. To say that reforestation of our thousands of denuded acres is the one and only solution to the annual flood menace is of course exaggeration.*

*Replanting trees at the headwaters of all the big streams will offer some relief, however, and some program of organized reforestation, if adopted now, will go far toward reducing the floods of future generations. It will also provide those future generations with timber, the supply of which, as the whole country knows, is rapidly dwindling.—Worcester Post.*

IT WOULD HELP . . . . . by John Hix

# Make These Additions To Your Nature Library

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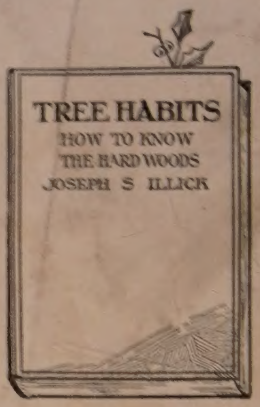


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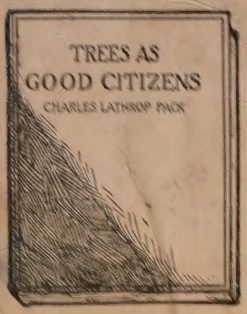


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